TY-All Branch

Shri Balasaheb Mane Shikshan Prasarak Mandal, Ambap's

ASHOKRAO MANE GROUP OF INSTITUTIONS

Vathar Tarf Vadgaon-416112 Tal. Hatkanangle, Dist Kolhapur

CENTRAL LIBRARY

QUESTION PAPER: (B.Tech/M.Tech/MBA)

Class: TY B.Tech. Dept: All Branch

Exam date: / / 20 Paper Quantity:.....

July - 2023

	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Winter Examination – 2022** **Course: B. Tech.** **Branch:** Mechanical **Semester :** Sixth (6th) **Subject Code & Name:** (BTMEC602) Machine Design II **Max Marks: 60** **Date:** **Duration: 3 Hr.**		
	Instructions to the Students: *1. All the questions are compulsory.* *2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.* *3. Use of non-programmable scientific calculators is allowed.* *4. Assume suitable data wherever necessary and mention it clearly.*		
		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	A single-row deep groove ball bearing is subjected to a pure radial force of 3 kN from a shaft that rotates at 600 rpm. The expected life L_{10h} of the bearing is 30,000 h. The minimum acceptable diameter of the shaft is 40 mm. Select a suitable ball bearing for this application from manufacturer's catalogue.	L3 Apply CO1 CO2	**6**
B)	A single-row deep groove ball bearing has dynamic load capacity of 40,500 N and operates on the following work cycle: (i) radial load of 5000 N at 500 rpm for 25% of the time; (ii) radial load of 10000 N at 700 rpm for 50% of the time; and (iii) radial load of 7000 N at 400 rpm for the remaining 25% of the time. Calculate the expected life of the bearing in hours.	L3 Apply CO1 CO2	**6**
C)	Explain a. Dynamic Load Carrying Capacity and b. Equivalent dynamic load for a roller bearing	L2 Understand OO1 CO2	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	It is required to design a pair of spur gears with 20° full-depth involute teeth based on the Lewis equation. The velocity factor is to be used to account for dynamic load. The pinion shaft is connected to a 10 kW, 1440 rpm motor. The starting torque of the motor is 150% of the rated torque. The speed reduction is 4:1. The pinion as well as the gear is made of plain carbon steel 40C8 (S_{ut} = 600 N/mm^2). The factor of safety can be taken as 1.5. Considering pitch line velocity v = 5 m/s, Calculate 1. Module based on beam strength 2. PCD of pinion and gear 3. Beam strength Refer Table for values of Lewis form factor.	L3 Apply CO4 CO5	**6**
B)	Differentiate between Spur Gears and Helical Gears.	L2 Understand CO4 CO5	**6**
C)	A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal	L3 Apply CO4	**6**

	module is 4 mm. The pinion as well as the gear is made of steel 40C8 (Sut = 600 N/mm^2) and heat treated to a surface hardness of 300 BHN. Calculate a. Virtual number of teeth b. Ratio Factor Q c. The Factor K d. Pitch circle diameter dp e. Wear Strength	CO5	
			12
Q. 3	**Solve Any Two of the following.**		
A)	Explain advantages and disadvantages of worm gears as compared to other gears.	Level 2 Understand CO4 CO5	6
B)	A pair of bevel gears, with 20° pressure angle, consists of a 20 teeth pinion meshing with a 30 teeth gear. The module is 4 mm, while the face width is 20 mm. The material for the pinion and gear is steel 50C4 (S_u = 750 N/mm^2). The gear teeth are lapped and ground (Class-3) and the surface hardness is 400 BHN. The pinion rotates at 500 rpm and receives 2.5 kW power from the electric motor. The starting torque of the motor is 150% of the rated torque. Calculate a. Pitch angle b. Virtual no. of teeth of pinion c. Lewis form factor for pinion d. Beam strength	L3 Apply CO4 CO5	6
C)	Explain following terminologies of worm gears. a. Axial Pitch b. Lead c. Lead angle	Level 2 Understand CO4 CO5	6
			12
Q.4	**Solve Any Two of the following.**		
A)	Explain advantages and disadvantages of belt drives as compared to gear drives.	Level 2 Understand CO4 CO5	6
B)	A chain drive is used in a special purpose vehicle. The vehicle is run by a 30kW rotary engine. There is a separate mechanical drive from the engine shaft to the intermediate shaft. The driving sprocket is fixed to this intermediate shaft. The efficiency of the drive between the engine and the intermediate shafts is 90%. The driving sprocket has 17 teeth and it rotates at 300 rpm. The driven sprocket rotates at 100 rpm. Assume moderate shock conditions and select a suitable four-strand chain for this drive. Use Given data from tables for selection of various factors.	Level 3 Apply CO4 CO5	6
C)	The following data is given for an open-type V-belt drive: diameter of driving pulley = 200 mm, diameter of driven pulley = 600 mm groove angle for sheaves = 34°, mass of belt = 0.5 kg/m maximum permissible tension in belt = 500 N, coefficient of friction = 0.2 contact angle for smaller pulley = 157°, speed of smaller pulley = 1440 rpm power to be transmitted = 10 kW. Calculate the tensions P_1 and P_2 in the	Level 3 Apply CO4 CO5	6

	belt.		
Q. 5	**Solve Any Two of the following.**		**12**
A)	An automotive plate clutch consists of two pairs of contacting surfaces with an asbestos friction lining. The torque transmitting capacity of the clutch is 550 N-m. The coefficient of friction is 0.25 and the permissible intensity of pressure is 0.5 N/mm^2. Due to space limitations, the outer diameter of the friction disk is fixed as 250 mm. Calculate (i) the inner diameter of the friction disk; and (ii) the spring force required to keep the clutch in an engaged position. Use uniform wear theory.	Level 3 Apply CO3	**6**
B)	A solid cast iron disk, 1 m in diameter and 0.2 m thick, is used as a flywheel. It is rotating at 350 rpm. It is brought to rest in 1.5 s by means of a brake. Calculate (i) the energy absorbed by the brake; and (ii) the torque capacity of the brake. Take mass density of cast iron = 7200 kg/m^3 and Radius of gyration of a solid disk about its axis of rotation = $\frac{d_{our}}{\sqrt{8}}$	Level 3 Apply CO3	**6**
C)	What is the meaning of autofrettage in cylinders? Explain three methods of prestressing the cylinders.	Level 2 Understand CO6	**6**
	***** End *****		

Table – Values of Lewis Form Factor Y for 20° Full Depth Involute System

z	Y	z	Y	z	Y
15	0.289	27	0.348	55	0.415
16	0.295	28	0.352	60	0.421
17	0.302	29	0.355	65	0.425
18	0.308	30	0.358	70	0.429
19	0.314	32	0.364	75	0.433
20	0.320	33	0.367	80	0.436
21	0.326	35	0.373	90	0.442
22	0.330	37	0.380	100	0.446
23	0.333	39	0.386	150	0.458
24	0.337	40	0.389	200	0.463
25	0.340	45	0.399	300	0.471
26	0.344	50	0.408	Rack	0.484

Table – Dimensions and Static and Dynamic Load Capacities of Single Row Deep Groove Ball Bearing

Principal dimensions (mm)			*Basic load ratings (N)*		*Designation*
d	D	B	C	C_0	
40	52	7	4160	3350	61808
	68	9	13300	7800	16008
	68	15	16800	9300	6008
	80	18	30700	16600	6208
	90	23	41000	22400	6308
	110	27	63700	36500	6408
45	58	7	6050	3800	61809
	75	10	15600	9300	16009
	75	16	21200	12200	6009
	85	19	33200	18600	6209
	100	25	52700	30000	6309
	120	29	76100	45500	6409
50	65	7	6240	4250	61810
	80	10	16300	10000	16010
	80	16	21600	13200	6010
	90	20	35100	19600	6210
	110	27	61800	36000	6310
	130	31	87100	52000	6410

Design Data for Roller Chains

Table 14.2 *Power rating of simple roller chain*

Pinion speed (rpm)	Power (kW)								
	06 B	08A	08 B	10A	10 B	12A	12 B	16A	16 B
50	0.14	0.28	0.34	0.53	0.64	0.94	1.07	2.06	2.59
100	0.25	0.53	0.64	0.98	1.18	1.74	2.01	4.03	4.83
200	0.47	0.98	1.18	1.83	2.19	3.40	3.75	7.34	8.94
300	0.61	1.34	1.70	2.68	3.15	4.56	5.43	11.63	13.06
500	1.09	2.24	2.72	4.34	5.01	7.69	8.53	16.99	20.57
700	1.48	2.95	3.66	5.91	6.71	10.73	11.63	23.26	27.73
1000	2.03	3.94	5.09	8.05	8.97	14.32	15.65	28.63	34.89
1400	2.73	5.28	6.81	11.18	11.67	14.32	18.15	18.49	38.47
1800	3.44	6.98	8.10	8.05	13.03	10.44	19.85	—	—
2000	3.80	6.26	8.67	7.16	13.49	8.50	20.57	—	—

Table 14.3 *Service factor (K_s)*

Type of driven load	Type of input power		
	IC engine with hydraulic drive	*Electric motor*	*IC engine with mechanical drive*
(i) *Smooth:* agitator, fan, light conveyor	1.0	1.0	1.2
(ii) *Moderate shock:* machine tools, crane, heavy conveyor, food mixer, grinder	1.2	1.3	1.4
(iii) *Heavy shock:* punch press, hammer mill, reciprocating conveyor, rolling mill drive	1.4	1.4	1.7

Table 14.4 *Multiple strand factor (K_3)*

Number of strands	K_3
1	1.0
2	1.7
3	2.5
4	3.3
5	3.9
6	4.6

Table 14.5 *Tooth correction factor (K_2)*

Number of teeth on the driving sprocket	K_2
15	0.85
16	0.92
17	1.00
18	1.05
19	1.11
20	1.18
21	1.26
22	1.29
23	1.35
24	1.41
25	1.46
30	1.73

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2023

Course: B. Tech. Branch :Mechanical Engineering Semester : VI

Subject Code & Name: BTMPE603A - IC Engines

Max Marks: 60 Date: 17 -07- 2023 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	Explain with neat diagram working of Two Stroke Spark Ignition engine.	(Understand)	6
B)	Explain the losses involved in actual fuel-air cycle.	(Understand)	6
C)	Describe the following Engine Nomenclature: 1)Swept Volume. 2)Clearance Volume. 3)Compression Ratio. (Draw a neat sketch to define above terms).	(Understand)	6
Q.2	**Solve Any Two of the following.**		
A)	Explain with the help of P-θ diagram, different stages of combustion in Compression Ignition engine.	(Understand)	6
B)	Describe the phenomenon of Detonation in Spark Ignition Engine.	(Understand)	6
C)	What are the objectives of combustion chamber design for CI Engine?	(Understand)	6
Q. 3	**Solve Any Two of the following.**		
A)	Explain the working of Simple Carburetor with neat diagram and states its limitations.	(Understand)	6
B)	Explain Battery Ignition System with neat diagram	(Understand)	6
C)	Discuss "Force circulation cooling system" of engine.	(Understand)	6
Q.4	**Solve Any Two of the following.**		
A)	What do you mean by super charger? Discuss its effect on – (i)Power output, (ii) Mechanical efficiency (iii) Fuel consumption	(Understand)	6
B)	What are the ways to control engine emissions? Explain any one in details	(Understand)	6
C)	During trial of a single cylinder, 4 stroke oil engine the following results were obtained: Cyl bore=200mm, Stroke=400mm, mep=6 bar, Torque=407Nm, speed=250 RPM, Oil consumption=4kg/hr, CV of fuel=43MJ/kg,	(Application)	6

Cooling water rate=4.5kg/min, Air used per kg of fuel= 30kg, Rise in cooling water temp=45°C, Temp of Exhaust gases=420°C, Room temp=20°C, mean sp. heat of exhaust gases=1kJ/kgK, Sp. Heat of water=4.18kJ/kgK, Barometric pressure=1.01325 bar Find IP, BP and draw up heat balance sheet in kJ/hr.

Q. 5 Solve <u>Any Two</u> of the following.

A)	Explain Fuel Cell Technology with a neat diagram.	(Understand)	6
B)	Why there is need of alternative fuels? List out different alternative fuels of engine and explain any one.	(Understand)	6
C)	Compare Electric vehicle with Hybrid Electric vehicle and list advantages of Hybrid vehicle	(Understand)	6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch : Mechanical** **Semester : 6**

Subject Code & Name: BTMPE604B , Product Life Cycle Management

Max Marks: 60 **Date: 19/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Define PLM and explain need for PLM.	**CO1**	**6**
B)	List and explain the Phases of PLM.	**CO6**	**6**
C)	What do you mean by PLM feasibility study? Explain.	**CO1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	What are different components of PDM systems?	**CO2**	**6**
B)	What is product data management? List out the advantages of PDM.	**CO2**	**6**
C)	What are different barriers for PDM implementation?	**CO2**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Explain various steps involved in the engineering design	**CO3**	**6**
B)	Write a short note on recycling	**CO3**	**6**
C)	Discuss the role of concurrent engineering in product design.	**CO3**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	How to estimate market opportunities for new product	**CO4**	**6**
B)	Explain market entry decision in new product development	**CO4**	**6**
C)	What is new product development what are the benefits of it.	**CO4**	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	With neat figure explain relevance tree	**CO5**	**6**
B)	Define technology forecasting and its necessity	**CO5**	**6**
C)	List methods of technology forecasting and explain morphological methods	**CO5**	**6**
	***** End *****		

The grid and the borders of the table will be hidden before final printing.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch : Mechanical Engineering**

Semester : VI Semester

Subject Code : BTMOE605A

Subject Name: Quantitative Techniques and Project Management

Max Marks: 60 **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	Define Quantitative Techniques In Project Management; Also discuss its Industrial application and limitations.	**1**	**6**
B)	What are the advantages of linear programming method? Explain limitations to solve graphical method problem.	**1**	**6**
C)	Solve the following LPP Maximize $Z = 2x_1 + 5x_2$ subject to the conditions: $x_1 + 4x_2 \leq 24$ $3x_1 + x_2 \leq 21$ $x_1 + x_2 \leq 9$ and $x_1, x_2 \geq 0$	**1**	**6**
Q.2	**Solve Any One of the following.**		
A)	Solve the following Assignment problem.	**2**	**12**

	I	II	III	IV	V
1	11	17	8	16	20
2	9	7	12	6	15
3	16	16	15	12	16
4	21	24	17	28	26
5	14	10	12	11	13

B)	Find the optimum solution to following transportation problem in which the cells contain the transportation cost in Rupees.				**2**	**12**

	W1	W2	W3	W4	W5	Available
F1	7	6	4	5	9	40

	F2	8	5	6	7	8	30		
	F3	6	8	9	6	5	20		
	F4	5	7	7	8	6	10		
	Required	30	30	15	20	5			
Q. 3	**Solve Any One of the following.**								
A)	1) Define Queuing system; Also explain assumption of Queuing theory.							3	6
	2) Discuss the basic Terminology of waiting line model.							3	6
B)	The failure rate observed at certain type of electric bulb shown in the table. The cost of replacing individual fails bulb Rs 1.25/bulb. The decision is made to replace all bulbs simultaneously at fixed interval & also to replace individual bulb as when fail in service. Number of bulb are 1000. If cost of group replacement is Rs 0.30/bulb. What is best interval for group replacement?							3	12
	Week	1	2	3	4	5	6	7	8
	probability	0.05	0.13	0.25	0.43	0.68	0.88	0.96	1.00
Q.4	**Solve Any Two of the following.**								
A)	Obtain an expression for the EOQ for any inventory model, stating the assumption made. What are the limitations of EOQ formula?							4	6
B)	Distinguish between dependent demand and independent demand, duly indicating the techniques you would adopt for inventories under these classifications.							4	6
C)	A manufacturing company purchase 9000 parts of a machine for its annual requirements, ordering one month usage at a time. Each part cost Rs. 20. The ordering cost per order is Rs. 15 and carrying charges are 15% of the average inventory per year. Find out a more economical purchasing policy for the company.							4	6
Q. 5	**Solve Any One of the following.**								
A)	A project consists of 12 activities. The time estimates in days of different activities are given in table. Construct a network to represents the above project; also find expected time, standard deviation, variance of each activity and critical path, project duration.							5	12

	Activities	A	B	C	D	E	F	G	H	I	J	K	L		
	Depend on	-	A	A	B	C	C	D,E	F	G,H	G,H	I	J		
	To	1	1	1	3	2	3	4	6	2	4	1	3		
	T_M	2	2	3	4	3	5	5	7	4	6	2	5		
	T_P	3	3	5	5	4	7	6	8	6	8	3	7		

B) The project consists of 6 activities as shown below. If the indirect cost is Rs. 75 per day. 1) Draw the activity network of the project. 2) Find critical path, optimum project duration and cost. **5** **12**

Activity	Depends on	Normal		Crash	
		Time	Cost	Time	Cost
A	-	8	100	6	200
B	-	4	150	2	350
C	B	2	50	2	50
D	A	10	100	5	400
E	A	5	100	1	200
F	E	3	80	1	100

*** End ***

The grid and the borders of the table will be hidden before final printing.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch : Mechanical Engineering** **Semester : VI**

Subject Code & Name: BTMEC605A Quantitative Techniques in Project Management

Max Marks: 60 **Date: 22/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Discuss the history of Operations Research. What are the applications of Operations Research?	**1**	**6**
B)	Solve the following LPP using graphical method. $Maximize, Z = 6x_1 + 8x_2$ Subject to, $5x_1 + 10x_2 \leq 60$ $4x_1 + 4x_2 \leq 40$ Where, x_1 and $x_2 \geq 0$	**1**	**6**
C)	Solve the following LPP by simplex method $Maximize, Z = 4x_1 + 3x_2$ Subject to, $2x_1 + x_2 \leq 1000$ $x_1 + x_2 \leq 800$ $x_1 \leq 400$ $x_2 \leq 700$ Where, x_1 $x_2 \geq 0$	**1**	**6**

Q.2	**Solve Any Two of the following.**		**12**
A)	Find initial solution of the following transportation problem by; i) North west corner method, and ii) Least cost method.	**2**	**6**

		1	2	3	4	Supply
Source	1	3	1	7	4	300
	2	2	6	5	9	400
	3	8	3	3	2	500
Demand		250	350	400	200	

B) Find out the optimum transportation plan of the following transportation problem by using MODI method. (Use NWC method to find Initial basic feasible solution). 2 6

		1	2	3	Supply
Source	1	11	9	6	40
	2	12	14	11	50
	3	10	8	10	40
Demand		55	45	30	

C) Solve the following assignment problem by Hungarian method. The matrix entries represent processing time in hours. 2 6

Operator

Job	1	2	3	4	5
1	10	12	15	12	8
2	7	16	14	14	11
3	13	14	7	9	9
4	12	10	11	13	10
5	8	13	15	11	15

12

Q. 3 Solve Any Two of the following.

A) A self-service store employs one cashier at its counter. 9 customers arrive on an average every 5 minutes while the cashier can serve 10 customers in every 5 minutes. Assuming Poisson distribution for arrival rate and exponential distribution for service rate, find; 3 6

1) Average number of customers in the system
2) Average number of customers in the queue
3) Average time a customer spends in the system

B) The cost of the machine is Rs. 6000 and the scrap value is Rs. 100. The maintenance cost found from experience are as follows; 4 6

Year	1	2	3	4	5	6	7	8
Maintenance cost (Rs.	100	250	400	600	900	1200	1600	2000

When should machine be replace?

C) Following mortality rates have been observed for certain types of light bulbs; 4 6

Week	1	2	3	4	5
% failing by the end of week	10	25	50	80	100

There are 1000 bulbs in use and it costs Rs. 1 to replace an individual bulb which has burnt out. If all bulbs were replaced simultaneously it would cost 25 Paise per bulb. It is proposed to replace all bulbs at fixed intervals

whether or not they have burnt out and to continue replacing burnt out bulbs as they fail. At what intervals should all bulbs be replace?

Q.4 Solve Any Two of the following. **12**

A) What is mean by in inventory? What is the necessity for maintaining inventory? Enlist the four deterministic models of inventory. **5** **6**

B) Ram industry needs 5400 units/year of a bought out component which will be used in its main product. The ordering cost is Rs. 250 per order and the carrying cost per unit per year is Rs. 30. Find: **5** **6**

1) Economic order quantity (EOQ),

2) Number of orders per year and

3) Time between successive orders.

C) An automobile factory manufactures a particular type of gear within the factory. This gear is used in the final assembly. The particulars of this gear are; demand rate (r) = 14000 units/ year, production rate (k) =35,000 units/year, set-up cost (Co) = Rs. 500 per set up and carrying cost (Cc) = Rs. 15 /unit/ year. Find **5** **6**

1) Economic order quantity and

2) Cycle time.

Q. 5 Solve Any Two of the following. **12**

A) What do you mean by project? Give at least five examples of project. What are the methods of representation of project in network form? **6** **6**

6 **6**

B) The details of activities involved in a project are summarized in the following table;

Activity	Immediate predecessor (s)	Duration (Months)
A	-	2
B	-	6
C	-	4
D	B	3
E	A	6
F	A	8
G	B	3
H	C, D	7
I	C, D	2
J	E	5
K	F, G, H	4
L	F, G, H	3
M	I	13
N	J, K	7

1) Construct the CPM network.

2) Determine the critical path and project completion time.

C) Different time estimates of the activities for a certain project are mentioned below; 6

Activity	Immediate predecessor(s)	Duration (weeks)		
		Optimistic time estimates	Most likely time estimates	Pessimistic time estimates
A	-	4	4	10
B	-	1	2	9
C	-	2	5	14
D	A	1	4	7
E	A	1	2	3
F	A	1	5	9
G	B, C	1	2	9
H	C	4	4	4
I	D	2	2	8
J	E, G	6	7	8

1) Construct the project network.

2) Find the expected duration and variance of each activity.

3) Find the critical path and the expected project completion time.

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Semester Examination – Summer 2023

Course: B. Tech in Mechanical Engineering **Sem: VI**

Subject Name: I C Engines **Subject Code: BTMEC604B**

Max Marks:60 **Date:26-07-2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All questions are compulsory*
2. *The level question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	Define the following terms 1. Clearance volume. 2. Swept volume. 3. Thermal efficiency.	**Understanding**	**6**
B)	Draw and explain valve timing diagram for 4-Strokes C.I. engine	**Understanding**	**6**
C)	Compare two stroke and four stroke engines in detail	**Analyzing**	**6**
Q.2	**Solve Any Two of the following.**		
A)	What are the design requirements of SI engine combustion chamber? Explain any two types of combustion chambers	**Understanding**	**6**
B)	Explain the factors influenced of engine variable on flame speed	**Understanding**	**6**
C)	Explain with figure abnormal combustion in CI engine	**Understanding**	**6**
Q. 3	**Solve any two of the following.**		
A)	Define carburetion and explain the factors affecting on the process of carburetion.	**Understanding**	**6**
B)	What the different methods to measure frictional power of IC engines. Explain Willian's line method.	**Understanding**	**6**
C)	Explain Battery Ignition system of Engine with neat sketch	**Understanding**	**6**
Q.4	**Solve any two of the following.**		
A)	List the advantages and disadvantages of supercharging of diesel engine	**Understanding**	**6**
B)	State different exhaust emission of IC Engine. Explain its effects on ecology	**Understanding**	**6**

C) A Six-cylinder SI Engine operates on four stroke cycle. The bore of each cylinder is 80 mm and stroke is 100 mm. the clearance volume per cylinder is 70 cc. At a speed of 4000 rpm the fuel consumption is 20 kg/ hr. and torque is 150 N.m. Calculate **Applying** 6

1. Brake Power.
2. Brake Mean Effective Pressure
3. Brake Thermal Efficiency

Assume Calorific value of fuel as 43,000 kJ/kg.

Q. 5 Solve any two of the following.

A) Describe the sources for the production of Biodiesel and its advantages for utilization in IC engines **Understanding** 6

B) What are the types of fuel cell? Explain anyone. **Understanding** 6

C) Advantages and limitations of electric and hybrid vehicle. **Understanding** 6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,

LONERE-RAIGAD-402103

Supplementary Semester Examination Summer -2023

Branch: T.E. Mechanical Engg. **Semester: - VI**

Subject with Subject Code Name: Applied Thermodynamics II **Marks-60**

(Code: BTMEC603)

Date:- **Time:- 3hrs**

Instructions to the Students

1. All the Questions are **compulsory.**
2. Use of non –a programmable calculator is **allowed**
3. Illustrate your answers with neat sketches, diagrams etc., wherever necessary
4. **Assume suitable data** with justification, in case the data provided is insufficient to solve problem
5. Use of steam table is permitted.

Q. No.		Level/CO	Marks
Q.1	**Solve any two of the following**		
A)	Clearly differentiate between i. Two stroke and Four stroke engine based on Fuel supply & exhaust arrangement, No of power stroke per cycle and thermal efficiency ii. SI and CI engines based on Ignition methodology, introduction of Fuel and compression ratio	Remember and understand	3+3
B)	Obtain the Air Standard efficiency expression of the simple Otto cycle with suitable illustration.	Understand	6
C)	A gas engine working on the Otto cycle has a cylinder of diameter 200 mm and stroke 250 mm. The clearance volume is 1570 cc. Find the air standard efficiency. Assume Cp = 1.004 kJ/kg K and Cv = 0.717 kJ/kg K for air.	Analysis	6
Q.2	Describe following Engine systems (**ANY TWO**) i. Engine water cooling system ii. SI engine ignition system iii. Mist Engine lubrication system	Understand	6 +6
Q.3	**Solve any two of the following**		
A)	Explain the simple Air refrigeration system assisted with necessary cycle and flow diagram.	Understand	6
B)	Explain the following: TON of refrigeration, COP and Cooling capacity per TR	Remember and Understand	2X3

C)	Briefly explain the simple Vapour Absorption system assited with flow diagram and enlist the three advantages over the vapour compression system.	Understand and Remember	3+3
Q.4	**Solve any two of the following**		
A)	Define the following: Relative Humidity, Specific Humidity and Room Sensible heat factor	Remember	2X3
B)	For a room moist air at the temperature 30 ^{0}C and dew point temperature 18 ^{0}C, find the RH, Sp. Humidity and enthalpy of the moist air.	Analysis	2X3
C)	Write down the three objectives of the Control systems in refrigeration and air conditioning and define the fail safe design.	Remember and Understand	3+3
Q.5	**Solve any two of the following**		
A)	Enlist six factors to be considered while site selection of the thermal power plant.	Remember	6
B)	Compare the Open cycle and close cycle gas turbine power plant with suitable flow diagrams.	Remember/understand	6
C)	Enlist the three advantages and three disadvantages of the Nuclear Power plant over other convention power plants.	Remember	6

End

	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Summer Examination – 2023** **Course: B. Tech. Branch : Mechanical Engineering Semester: VI** **Subject Code & Name: BTMC601 & Manufacturing Processes-II** **Max Marks: 60 Date: Duration: 3 Hrs.**		
	Instructions to the Students: 1. *All the questions are compulsory.* 2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.* 3. *Use of non-programmable scientific calculators is allowed.* 4. *Assume suitable data wherever necessary and mention it clearly.*		
		Level	**Marks**
Q. 1	**Solve *Any Two* of the following.**		**12**
A)	Define abrasive machining and explain its importance. Draw a schematic diagram of grinding process.	*Remember*	**6**
B)	What are the super-abrasives? Which super-abrasive is recommended for grinding of steels and why?	*Understand*	**6**
C)	Define G-ratio in grinding operation and explain why does it vary widely.	*Analyse*	**6**
Q.2	**Solve *Any Two* of the following.**		**12**
A)	What is mechanics of metal cutting? What are its objectives? Draw a schematic diagram of metal cutting showing the workpiece, cutting tool, and chip.	*Remember*	**6**
B)	What is rake angle? Explain positive rake angle and negative rake angle with the help of a schematic diagrams. Why is clearance angle provided on the cutting tool?	*Understand*	**6**
C)	Define specific cutting energy. What is its importance? What are the parameters affecting it?	*Remember*	**6**
Q. 3	**Solve *Any Two* of the following.**		**12**
A)	Explain the principle of measurement of cutting temperature with radiation methods. What is the principle of correlation of cutting temperature with hardness and microstructure changes in the cutting tool material?	*Remember*	**6**
B)	Explain the basic requirements of cutting tool materials. What are the major classes of cutting tool materials?	*Understand*	**6**
C)	Define machinability and discuss the factors affecting the machinability of metals.	*Remember*	**6**

Q.4	**Solve *Any Two* of the following.**		12
A)	Define atomization method of producing metal powders. Explain gas atomization and water atomization with the help of schematic diagrams.	*Remember*	6
B)	Discuss the purposes of blending of metal powders. What are the precautions to be taken during blending of metal powders?	*Understand*	6
C)	Discuss the sintering mechanisms with the help of schematic diagrams.	*Remember*	6
Q. 5	**Solve *Any Two* of the following.**		12
A)	Describe the processes for producing polymer sheets and films.	*Remember*	6
B)	Explain injection molding process with the help of a schematic diagram.	*Understand*	6
C)	Discuss thermoforming process with the help of a suitable diagram.	*Understand*	6
	***** End *****		

The grid and the borders of the table will be hidden before final printing.

TY- mech -

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch :** Mechanical Engineering **Semester :** VI

Subject Code & Name: BTMC602 Machine Design II

Max Marks: 60 **Date: 14/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	A single-row deep groove ball bearing is subjected to a pure radial force of 3 kN from a shaft that rotates at 600 rpm. The expected life L10h of the bearing is 30,000 h. The minimum acceptable diameter of the shaft is 40 mm. Select a suitable ball bearing for this application from manufacturer's catalogue.	L3 Apply CO1 CO2	**6**
B)	Explain a. Dynamic Load Carrying Capacity and b. Equivalent dynamic load for a roller bearing	L2 Understand CO1 CO2	**6**
C)	A single-row deep groove ball bearing has a dynamic load capacity of 40500 N and operates on the following work cycle: (i) radial load of 5000 N at 500 rpm for 25% of the time; (ii) radial load of 10000 N at 700 rpm for 50% of the time; and (iii) radial load of 7000 N at 400 rpm for the remaining 25% of the time. Calculate the expected life of the bearing in hours.	L3 Apply CO1 CO2	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	It is required to design a pair of spur gears with 20° full-depth involute teeth based on the Lewis equation. The velocity factor is to be used to account for dynamic load. The pinion shaft is connected to a 10 kW, 1440 rpm motor. The starting torque of the motor is 150% of the rated torque. The speed reduction is 4:1. The pinion as well as the gear is made of plain carbon steel 40C8 (Sut = 600 N/mm^2). The factor of safety can be taken as 1.5. Considering pitch line velocity 5 m/s to begin, calculate 1. No. of teeth on pinion and gear 2. Module based on beam strength 3. PCD of pinion and gear 4. Effective load in gear tooth using corrected pitch line velocity 5. Beam strength	L3 Apply CO4 CO5	**6**
B)	A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 (Sut = 600 N/mm^2) and heat treated to a surface hardness of 300 BHN. Calculate beam strength and wear strength of helical gears.	L3 Apply CO4 CO5	**6**

C) Differentiate between Spur Gears and Helical Gears. L2 Understand CO4 CO5 6

Q. 3 Solve Any Two of the following. 12

A) A pair of bevel gears, with 20° pressure angle, consists of a 20 teeth pinion meshing with a 30 teeth gear. The module is 4 mm, while the face width is 20 mm. The material for the pinion and gear is steel 50C4 (Sut = 750 N/mm^2). The gear teeth are lapped and ground (Class-3) and the surface hardness is 400 BHN. The pinion rotates at 500 rpm and receives 2.5 kW power from the electric motor. The starting torque of the motor is 150% of the rated torque. Determine L3 Apply CO4 CO5 6

1. Pitch angle
2. Virtual no. of teeth on pinion
3. Lewis Form Factor
4. PCD of pinion and gear
5. Cone Distance Ao
6. Bean Strength

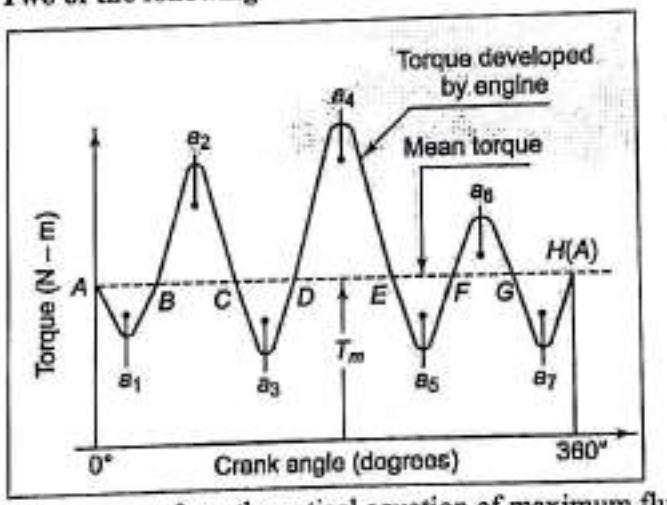
B) Explain advantages and disadvantages of worm gears as compared to other gears. Level 2 Understand CO4 CO5 6

C) Explain following terminologies of worm gears. Level 2 Understand CO4 CO5 6

a. Axial Pitch
b. Lead
c. Lead angle

Q.4 Solve Any Two of the following. 12

A) 6



Level 3 Apply

Demonstrate the concept & mathematical equation of maximum fluctuation of energy and coefficient of fluctuation of energy by using this diagram.

B) A chain drive is used in a special purpose vehicle. The vehicle is run by a 30kW rotary engine. There is a separate mechanical drive from the engine shaft to the intermediate shaft. The driving sprocket is fixed to this intermediate shaft. The efficiency of the drive between the engine and the intermediate shafts is 90%. The driving sprocket has 17 teeth and it rotates at 300 rpm. The driven sprocket rotates at 100 rpm. Assume moderate shock conditions and select a suitable four-strand chain for this drive. Level 3 Apply CO5 6

Use Given data from tables for selection of various factors.

C)	It is required to select a flat belt drive for a compressor running at 720 rpm, which is driven by a 25 kW, 1440 rpm motor. Space is available for a centre distance of 3 m. The belt is open-type. Use belt velocity as 18 m/s.	L3 Apply CO5	6
Q. 5	**Solve Any Two of the following.**		**12**
A)	A pivoted double-block brake, has two shoes, which subtend an angle (2θ) of 100°. The diameter of the brake drum is 500 mm and the width of the friction lining is 100 mm. The coefficient of friction is 0.2 and the maximum intensity of pressure between the lining and the brake drum is 0.5 N/mm^2. The pivot of each shoe is located in such a manner that the moment of the frictional force on the shoe is zero. Calculate: (i) the distance of the pivot from the axis of the brake drum (ii) the torque capacity of each shoe (iii) the reactions at the pivot	L3 Apply CO3	6
B)	An automotive plate clutch consists of two pairs of contacting surfaces with an asbestos friction lining. The torque transmitting capacity of the clutch is 550 N-m. The coefficient of friction is 0.25 and the permissible intensity of pressure is 0.5 N/mm^2. Due to space limitations, the outer diameter of the friction disk is fixed as 250 mm. Calculate (i) the inner diameter of the friction disk; and (ii) the spring force required to keep the clutch in an engaged position. Use uniform wear theory.	L3 Apply CO3	6
C)	A cone clutch with asbestos friction lining transmits 30 kW power at 500 rpm. The coefficient of friction is 0.2 and the permissible intensity of pressure is 0.35 N/mm^2. The semi-cone angle α is 12.5°. The outer diameter is fixed as 300 mm from space limitations. Assuming uniform wear theory, calculate: (i) the inner diameter; (ii) the face width of the friction lining; and (iii) the force required to engage the clutch.	L3 Apply CO3	6

*** End ***

Data Tables for Belt Design

Table 13.1 *Load correction factor (F_a)*

Type of load	F_a
(i) Normal load	1.0
(ii) Steady load, e.g., centrifugal pumps, fans, light machine tools, conveyors	1.2
(iii) Intermittent load, e.g., heavy duty fans, blowers, compressors, reciprocating pumps, line shafts, heavy-duty machines	1.3
(iv) Shock load, e.g., vacuum pumps, rolling mills, hammers, grinders	1.5

Table 13.2 *Arc of contact factor (F_d)*

α_s (Deg.)	120	130	140	150	160	170	180	190	200
F_d	1.33	1.26	1.19	1.13	1.08	1.04	1.00	0.97	0.94

HI-SPEED	0.0118 kW per mm width per ply
FORT	0.0147 kW per mm width per ply

The standard widths of belts (in mm)

3-Ply	25	40	50	63	76	90	100	112	125	152
4-Ply	40	44	50	63	76					
5-Ply	76	100	112	125	152					
6-Ply	112	125	152	180	200					

Table 13.3 *Minimum pulley diameters for given belt speeds and belt plies (mm)*

No. of plies	*Maximum belt speed (m/s)*				
	10	*15*	*20*	*25*	*30*
3	90	100	112	140	180
4	140	160	180	200	250
5	200	224	250	315	355
6	250	315	355	400	450
7	355	400	450	500	560
8	450	500	560	630	710
9	560	630	710	800	900
10	630	710	800	900	1000

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination –Summer 2023

Course: T.Y.B. Tech. **Branch: Electrical Engineering.** **Semester :VI**

Subject Code & Name: (BTEEC602) Electrical Machine Design

Max Marks: 60 **Date:15/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	What are the limitations in the design of Electrical Machines? Explain them?	Remember	6
B)	Explain briefly study of Magnetic, Electric, Dielectric material?	Understand	6
C)	Explain important and advantages of Computer Aided Designing of transformer and rotating machines	Remember	6
Q.2	**Solve Any Two of the following.**		
A)	Derive expression of design of heating elements.	Remember	6
B)	Explain the design procedure for chokes (Small Inductors).	Understand	6
C)	A 250 V, 37kW, d.c. shunt motor has to exert a maximum torque of 150 per-cent of full load torque during the starting period. The resistance of armature circuit is 0.2 Ω and full load efficiency is 84 per cent. The number of studs is 8. Determine (i) The upper and lower limits of current during starting. (ii) The resistance of each section.	Analyze	6
Q. 3	**Solve Any Two of the following.**		
A)	Derive the output equation of three phase induction motor.	Remember	6
B)	Explain specific electric & magnetic loading factor for induction motor.	Understand	6
C)	Which factors affecting length of air gap for three phase induction motor?	Understand	6
Q.4	**Solve Any Two of the following.**		
A)	Explain different mode of heat dissipiatation.	Understand	6
B)	Derive the equation of temperature rise of a machine when it is run under steady load conditions starting from cold condition? (Heating Time-Constant & Heating - Curve)	Remember	6
C)	Derive the expression for quantity of cooling medium (air, water, oil,hydrogen coolant)	Remember	6

Q. 5 Solve Any Two of the following.

A) Derive expression for design of tank with tubes. Remember

B) For a Transformer show that emf per turn Et is given by $E_t = K\sqrt{Q}$ where Q=kVA Capacity of Transformer. Remember

C) Determine the dimensions of core & yoke for a 200 kVA, 50 Hz, single phase core type transformer. A cruciform core is used with distance between adjacent limbs equal to 1.6 times the width of core laminations. Assume voltage per turn 14 V, max. Flux density 1.1 wb/m^2, window space factor 0.32, current density 3 A/mm^2 & stacking factor= 0.9 the net iron area is 0.56 d^2 in a cruciform core. Also the width of largest stamping is 0.85 d. Analyze

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

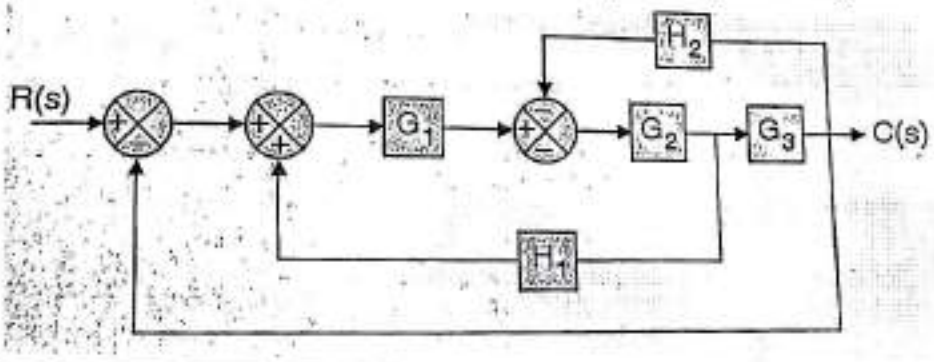
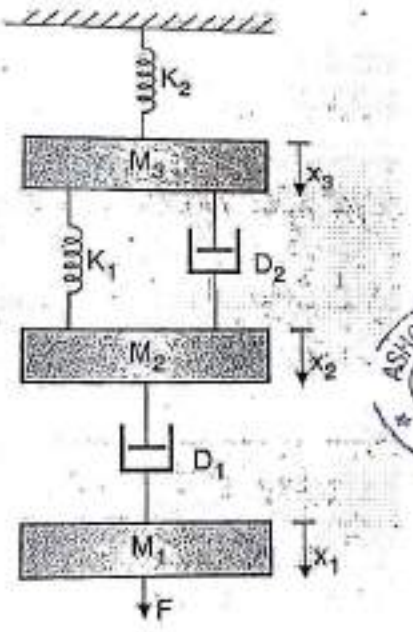
Course: B. Tech. **Branch :Electrical** **Semester :VI**

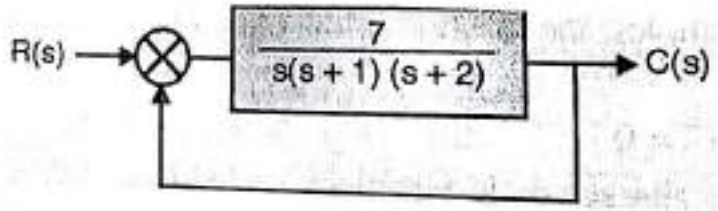
Subject Code & Name: BTEEC603 **Subject: Control system Engineering**

Max Marks: 60 **Date:** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**	CO1	**12**
A)	**Explain signal flow graph in detail with the help of Masons gain formula.**	CO1	**6**
B)	**Using the block diagram reduction technique, find the closed loop transfer function of the system whose block diagram is given in figure.** 	CO1	**6**
C)	**Obtained the analogous electrical network for the system shown in figure.** 		**6**

Q.2	Solve Any Two of the following.		12
A)	A unity feedback system has $G(s) = \frac{20(s+3)}{(s+1)(s+6)}$ Determine type of system, all error coefficient, error when subjected to a step of magnitude 2.	CO2	6
B)	Determine the stability using Routh's Criteria : $s^5+2s^4+3s^3+6s^2+2s+1$	CO2	6
C)	Check whether the given system is stable or not by using Hurwitz criterion. 	CO2	6
Q. 3	Solve Any Two of the following.		12
A)	Derive the transfer function of lead compensator using electrical network.	CO3	6
B)	Draw the approximate root-locus diagram for close loop system whose transfer function is given by $G(s)H(s)=\frac{k}{s(s+5)(s+10)}$	CO3	6
C)	Sketch the Bode plot showing the magnitude the decibel and phase angle in degrees as a function of log frequency for the transfer function given below. Determine the gain cross-over frequency ω_{gc}. $$G(s) = \frac{10}{s(1+0.5s)(1+0.01s)}$$	CO3	6
Q.4	Solve Any Two of the following.		12
A)	Write a short note on PI controller and PID controller.	CO4	6
B)	What are the effects of proportional, integral and derivative control on the time response of the system.	CO4	6
C)	A PI controller is used to control a system. It has the following settings, $k_p = 2\%$, $k_I = 3\%$ per minutes, $m(0) = 25\%$. The error signal is found to be $4t + 2$. Find the controller output in percent after 2 minutes.	CO4	6
Q. 5	Solve Any Two of the following.		12
A)	Obtain the state model for the system with the transfer function $y(s) = \frac{3s+4}{s2+5s+6}$	CO5	6
B)	Find the state transition matrix for, $A = \begin{bmatrix} 1 & 0 \\ -6 & -5 \end{bmatrix}$	CO5	6

C)	**A linear time invariant system is characterized by the state variable model. Comment on the controllability and observability of the system.** $\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$ $Y(t) = \begin{bmatrix} 1 & 2 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$	CO5	6
	*** End ***		

	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Supplementary Summer Examination – 2023** **Course: T. Y. B. Tech.** **Branch :**Electrical Engineering **Semester :VI** **Subject Code & Name:** BTEEC603 Power Electronics **Max Marks: 60** **Date: 18/07/2023** **Duration: 3 Hr.**		
	Instructions to the Students: *1. All the questions are compulsory.* *2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.* *3. Use of non-programmable scientific calculators is allowed.* *4. Assume suitable data wherever necessary and mention it clearly.*		
		LEVEL/CO	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Draw symbol & Explain characteristics of MOSFET & SIT.	**CO2**	**6**
B)	Explain different area of application of power electronics.	**CO1**	**6**
C)	Write short note on AC-DC converter, DC-AC converter, DC-DC converter.	**CO2**	**6**
Q.2	**Solve Any Two of the following.**		
A)	Write short note on Pulse transformer,optocoupler,IGBT	**CO1**	**6**
B)	What are the different firing schemes in thyristors?Explain the thyristor firing using UJT.	**CO2**	**6**
C)	What are the different commutation schemes in thyristor? Explain any one of them in detail.	**CO1**	**6**
Q. 3	**Solve Any Two of the following.**		
A)	Explain single phase half controlled bridge rectifier with RL -load circuit and waveforms.	**CO2**	**6**
B)	Explain single phase fully controlled bridge rectifier with R-load circuit and waveforms.	**CO1**	**6**
C)	Explain half wave controlled rectifier with RL - load & freewheeling diode.	**CO2**	**6**
Q.4	**Solve Any Two of the following.**		
A)	Explain single phase a.c.voltage controller with R load circuit & waveforms.	**CO1**	**6**

B)	Explain basic principle of operation of a cycloconverter.	CO1	
C)	Explain three phase to three phase cycloconverters.	CO2	
Q. 5	**Solve Any Two of the following.**		
A)	Explain principle of step- down chopper (Buck converter).	CO1	
B)	Explain principle of step-up chopper (Boost converter).	CO1	
C)	Explain single phase full bridge inverter.	CO1	
	End		

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch : Electrical Engg.** **Semester :6th**

Subject Code & Name: FACTS, BTEEPE604A

Max Marks: 60 **Date:19/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	Solve Any Two of the following.		12
A)	Explain flow of power in parallel path AC system.	L2/CO1	6
B)	Explain factors affecting loading capability and limits of loading capability in brief.	L2/CO1	6
C)	Derive for power flow and dynamic stability consideration of Transmission interconnection.	L2/CO1	6
Q.2	Solve Any Two of the following.		12
A)	Explain types of FACTS controllers.	L2/CO2	6
B)	Write principle of series and shunt compensation.	L2/CO2	6
C)	Explain midpoint voltage regulation for long transmission line.	L2/CO2	6
Q. 3	Solve Any Two of the following.		12
A)	Explain static VAR compensator (SVC).	L1/CO3	6
B)	Write objective of shunt compensation.	L2/CO3	6
C)	Explain Thyristor Switched capacitor (TSC).	L2/CO3	6
Q.4	Solve Any Two of the following.		12
A)	Explain the working of thyristor switched series capacitor (TSSC).	L2/CO4	6
B)	Explain the working of thyristor controlled series compensators (TCSC) .	L2/CO4	6
C)	Explain switching converter type series compensator.	L2/CO4	6
Q. 5	Solve Any Two of the following.		12
A)	Compare between SVC and STATCOM.	L2/CO5	6
B)	Explain working of unified power flow controller (UPFC).	L2/CO6	6
C)	Explain basic principle of P and Q control.	L2/CO6	6
	*** End ***		

grid and the borders of the table will be hidden before final printing.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch : Electrical Engineering** **Semester : VI**

Subject Code & Name: Power Plant Engineering BTEEOE605B

Max Marks: 60 **Date:21/07/23** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		12
A)	**Explain the terms ; i) connected Load (ii) Maximum Demand (iii) Demand Factor (iv) Diversity Factor (v) Plant Capacity Factor (vi) Plant Use Factor**	CO1	6
B)	**Explain the Conventional and Non-Conventional sources of Energy**	CO1	6
C)	**generating station has the following daily load cycle :** Time (Hours) | 0—6 | 6—10 | 10—12 | 12—16 | 16—20 | 20—24 Load (MW) | 40 | 50 | 60 | 50 | 70 | 40 **Draw the load curve and find (i) maximum demand (ii) units generated per day (iii) average load and (iv) load factor.**	CO1	6
Q.2	**Solve Any Two of the following.**		12
A)	**Describe the Classification of Turbines used in Hydro-electric power plant.**	CO2	6
B)	**Explain the operational circuits of thermal power plant with Schematic diagram of thermal power plant.**	CO2	6
C)	**Elaborate Pumped Storage Plant.**	CO2	6
Q. 3	**Solve Any Two of the following.**		12
A)	**Describe the components of Gas Power Plant with its schematic diagram and also State the advantages and disadvantages of Gas Power Plant.**	CO3	6
B)	**Explain the working of diesel engine power plant and draw the schematic arrangements of it.**	CO3	6
C)	**Explain working principle of Nuclear power plant with diagram also state the advantages.**	CO3	6

Q.4	Solve Any Two of the following.		12
A)	Explain Solar power generation with neat diagram of solar power plant.	CO4	6
B)	Describe the Biogas power plant.	CO4	6
C)	Explain working of MHD power plant with neat diagram.	CO4	6
Q. 5	Solve Any Two of the following.		12
A)	How will you select the choice of size and number of generator units, Explain with example.	CO5	6
B)	Explain different types of tariff.	CO5	6
C)	A consumer has a maximum demand of 200 kW at 40% load factor. If the tariff is Rs. 100 per kW of maximum demand plus 10 paise per kWh, find the overall cost per kWh.	CO5	6
	*** End ***		

The grid and the borders of the table will be hidden before final printing.

DR.BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination-2023

Course: B. Tech. **Branch: Electrical Engineering**

Subject- Elective II A. Switchgear & Protection (BTEEC605A) **Semester: VI**

Max. Marks: 60 **Date:** 22/07/2023 **Duration: 3 Hr.**

Instructions:
1) All the questions are compulsory.
2) If require make appropriate assumptions with clear explanation.
3) Use of non-programmable scientific calculators is allowed.

Q.1)		**Solve any two of the following question.**	**12**
	A)	Explain primary & backup protection in detail?	**6**
	B)	Give the details of construction and operating principle of Induction type relay?	**6**
	c)	Explain different methods of earthing?	**6**
Q.2)		**Solve any two of the following question.**	**12**
	A)	Explain Amplitude and phase comparator techniques in Detail.	**6**
	B)	Explain Numerical Relays in Detail	**6**
	C)	Draw & Explain the characteristics of directional relays & distance relays.	**6**
Q.3)		**Solve any two of the following question.**	**12**
	A)	Describe the construction & working of Vacuum circuit breaker?	**6**
	B)	Define following terms:	**6**
		I. Arc Voltage	
		II. Restriking Voltage	
		III. Recovery Voltage	
	C)	Explain rating of circuit breaker. ?	**6**
Q.4)		**Solve any two of the following question.**	**12**
	A)	Explain carrier current protection scheme in detail. ?	**6**
	B)	Describe the construction & working Non directional over current relay.	**6**
	C)	Explain feeder protection scheme in detail. ?	**6**
Q.5)		**Solve any two of the following question.**	**12**
	A)	The neutral point of the three – phase 20MVA, 11KV alternator is earthed through a resistance of 5 Ω, the relay is set to operate when there is an out of balance current 1.5A.The CT,s have a ratio of 1000/5.	**6**

What percentage of winding is protected against an earth fault and what should be the minimum value of earthing resistance to protect 90% of winding?

B) Explain buchholz relay detail? 6

C) Explain Differential protection of transformer for different winding configurations 6

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch: Electrical Engineering** **Semester: VI**

Subject Code & Name: Project Management (BTEEOE606B)

Max Marks: 60 **Date:24/07/23** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	What are the important phases of a project life cycle? Discuss each phase briefly with key issues involved in it.	L2/CO1	**6**
B)	Explain project planning process.	L2/CO1	**6**
C)	What are characteristics of a project? Explain with suitable example.	L2/CO1	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	List different time estimation methods. Explain any one with suitable example.	L2/CO2	**6**
B)	Explain Risk Management Process.	L2/CO2	**6**
C)	Estimate time for each activity shown in table, using three-point estimation method.	L3/CO2	**6**

Activity	Time duration (weeks)		
	Optimistic	Most Likely	Pessimistic
A	2	4	12
B	10	12	26
C	8	9	10
D	10	15	20
E	7	8	11
F	9	9	9
G	3	4	7
H	5	5	7

Q. 3	**Solve Any Two of the following.**		**12**
A)	What is a work breakdown structure? Explain with an example.	L2/CO2	**6**
B)	Draw the network diagram for the following project. Find critical path and total time of the project.	L3/CO2	**6**

Activity	Predecessor	Duration
A	-	3
B	A	4
C	A	2
D	B	5
E	C	1
F	C	2
G	D, E	4
H	F, G	3

C) What is a linear responsibility chart or linear responsibility matrix? Write advantages and disadvantages of linear responsibility chart. L2/CO2 6

Q.4 Solve Any Two of the following. 12

A) What is project cash flow? Explain cash flow from the following: L2/CO2 6

1. Operating activities
2. Investing activities
3. Financing activities

B) Why is a post project review valuable to future projects? Explain post project evaluation. L2/CO4 6

C) The time and cost estimates of different activities of a project is given below: L4/CO2 6

Overhead cost is 2000 Rs per week.

Draw the network diagram and crash the project to 16 weeks, calculate the corresponding cost.

Activity	Predecessor	Normal Time	Crash Time	Normal Cash	Crash Cash
A	-	6	4	10000	14000
B	-	4	3	5000	8000
C	A	3	2	4000	5000
D	B	8	3	1000	6000
E	B	14	6	9000	13000
F	C,D	8	4	7000	8000

Q. 5 Solve Any Two of the following. 12

A) List different types of contract. Explain Fixed Price Contracts. L2/CO3 6

B) Explain procurement process in detail. L2/CO3 6

C) Explain how risk is handled while contracting. Give suitable example. L2/CO3 6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Summer Examination – 2023

Course: B. Tech. **Branch : Electrical Engineering** **Semester : VI**

Subject Code & Name: Industrial Automation And Control (BTEEE604A)

Max Marks: 60 **Date: 26/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/ CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Explain functional block diagram of actuator and sensor system	**L1**	**6**
B)	Explain with neat diagram automation pyramid	**L1**	**6**
C)	Explain the construction and principle operation of bourdon tube pressure gauge.	**L2**	**6**
Q. 2	**Solve Any Two of the following.**		**12**
A)	Write a short note on bellow and load cell	**L1**	**6**
B)	Explain the principle operation of inductive and capacitive type proximity sensor	**L1**	**6**
C)	Explain with neat diagram electromagnetic type flow meter.	**L2**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Explain the principle of PH measurement	**L1**	**6**
B)	Explain structure of PLC program	**L1**	**6**
C)	Describe RLL diagram. Explain its merits and demerits	**L2**	**6**
Q. 4	**Solve Any Two of the following.**		**12**
A)	Draw the graphical symbol used to depict typical hydraulic system components	**L1**	**6**
B)	Explain the basic principle of operation of pneumatically actuated control valve.	**L1**	**6**
C)	Sate and explain classification of control valve.	**L2**	**6**

			12
Q. 5	**Solve Any Two of the following.**		
A)	Describe principle of operation of hydraulic system components	L1	6
B)	Explain with simple sketch the principle of operation of flapper nozzle amplifier.	L1	6
C)	What is the function of air relay in pneumatic control.	L2	6

Winter Examination – 2022

Course: B. Tech. **Branch : Electrical Engineering** **Semester :VI**

Subject Code & Name: BTEEC605A Elective-VII A. Switch Gear and Protection

Max Marks: 60 **Date:** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		12
A)	Explain with block diagram Static relay with merits and demerits.	Understand	6
B)	Explain Primary and backup protection.	Understand	6
C)	With neat diagram describe the induction disc and induction cup type relay.	Understand	6
Q.2	**Solve Any Two of the following.**		12
A)	Explain in details with diagram SF6 C.B. Also write merits and demerits.	Understand	6
B)	Provide a detailed explanation of Miniature Oil Circuit Breaker (MOCB), including a diagram, and discuss its merits and demerits.	Understand	6
C)	Derive the expression for re-striking voltage of in case of a circuit breaker.	Apply	6
Q. 3	**Solve Any Two of the following.**		12
A)	Draw a general block diagram of a Numerical Type Relay and explain its merits and demerits in detail.	Understand	6
B)	Provide a detailed explanation, along with a block diagram, of a microprocessor-based overcurrent relay.	Understand	6
C)	Draw and explain the characteristics of impedance relay and MhO relay.	Apply	6
Q.4	**Solve Any Two of the following.**		12
A)	Explain in details busbar protection schemes.	Understand	6
B)	With neat diagram describe the operation of Buchholz relay used for transformer protection.	Understand	6
C)	With neat diagram explain the alternator protection against the stator faults.	Understand	6
Q. 5	**Solve Any Two of the following.**		12
A)	What is the significance of power system earthing. Explain in detail the different methods used for earthing?	Apply	6
B)	With neat diagram explain the percentage differential protection of transformer.	Apply	6
C)	With neat diagram explain the construction and operating principle of lightning arrester.	Understand	6

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2023

Course: B. Tech | Branch : Electrical | Semester : VI

Subject Code & Name: BTEEPE405D & Electronic Devices & Circuits

Max Marks: 60 | Date: 22 /07/2023 | Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	With neat diagram , explain hardly oscillator and derive an expression for the frequency of oscillation. Find the frequency of oscillation if L1= L2= 10mH and C= 0.1 μF.	(L2/CO1)	6
B)	Explain about FET as high impedance circuit.	(L1/ CO1)	6
C)	Explain RC coupled amplifier with it's diagram. Explain frequency response .Write its advantages and disadvantages.	(L2/CO1)	6
Q.2	**Solve Any Two of the following.**		**12**
A)	Discuss in details about various feedback typologies.	(L2/CO2)	6
B)	Write a short note on transistor as an amplifier.	(L2/CO2)	6
C)	Describe the Hartley and colpitts oscillator.	(L2/CO2)	6
Q. 3	**Solve Any Two of the following.**		**12**
A)	Explain the classification of amplifier in detail?	(L1/CO3)	6
B)	Explain with neat diagram construction and working of BJT.	(L4/CO3)	6
C)	Write a short note on principle of feedback amplifier.	(L4/CO3)	6
Q.4	**Solve Any Two of the following.**		**12**
A)	Draw and explain a Monostable and bistable multivibrator.	(L4/CO4)	6
B)	Draw and explain construction of n channel JFET and compare common source , common drain , and common gate configuration of JFET.	(L2/CO4)	6
C)	Compare class A , class B ,class AB, class C , class D amplifier.	(L2/CO4)	6
Q. 5	**Solve Any Two of the following.**		**12**
A)	Draw and explain internal block diagram of IC 555 and explain the working of astable multivibrator.	(L2/CO5)	6
B)	Explain CMOS inverter with circuits. And draw and explain the characteristics of CMOS inverter.	(L2/CO5)	6
C)	What is cross over distortion write its elimination methods.	(L3/CO5)	6

***** End *****

TY - Electrical

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

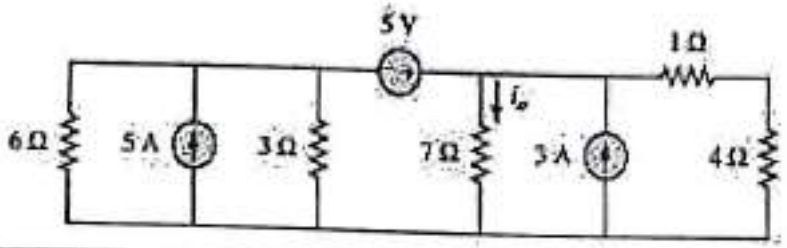
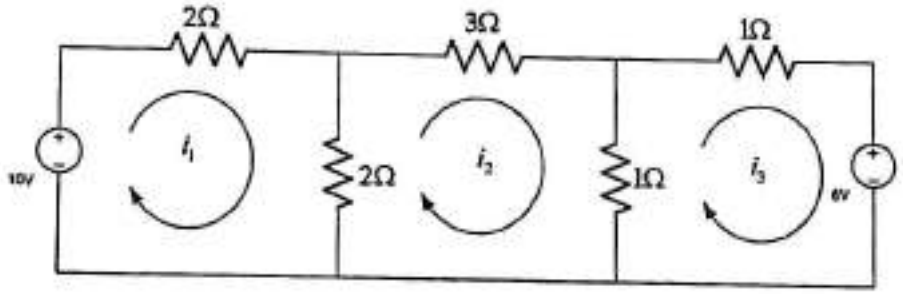
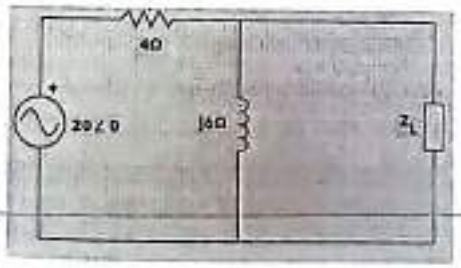
Course: B. Tech. **Branch : Electrical Egineering** **Semester :IV**

Subject Code & Name: BTEEC401 Network Theory

Max Marks: 60 **Date:** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	**What is relation between voltage, current and power?**	CO1	**6**
B)	**Solve the given network by using source transformation.** 	CO1	**6**
C)	**What is meant by lumped and distributed parameters? Explain.**	CO1	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	**Apply Kirchhoff's voltage law on given network.** 	CO2	**6**
B)	**Solve following network by using maximum power theorem on Z_L resistor.** 	CO2	**6**

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Regular Examination – 2023

Course: B. Tech. Branch :CSE/Computer Engineering Semester : VI

Subject Code & Name: BTCOC603 Machine Learning

Max Marks: 60 Date:17/07/2023 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	Solve Any Two of the following.		12
A)	Define machine learning. Explain its common areas of applications.	(Remember)	6
B)	Describe working of decision tree with suitable example.	(Apply)	6
C)	State the purpose of confusion metrics. Elaborate various terms associated with it.	(Understand)	6
Q.2	Solve Any Two of the following.		12
A)	State Bayestheorem. Demonstrateit with suitable example.	(Apply)	6
B)	With respect to SVM explain the terms: 1. Hyperplane 2. Maximum Margin Hyperplane (MMH) 3. Support Vector.	(Understand)	6
C)	Differentiate between linear and non-linear SVM.	(Analyze)	6
Q. 3	Solve Any Two of the following.		12
A)	Compare between Biological Neural Network (BNN) and Artificial Neural Network (ANN).	(Analyze)	6
B)	Explain reinforcement learning in Artificial Neural Network (ANN).	(Understand)	6
C)	Describe feedforward and feedback neural network with proper diagram.	(Understand)	6
Q.4	Solve Any Two of the following.		12
A)	Explain concept of VC dimensions with example.	(Remember)	6
B)	Discuss Ensembled Learning. State applications of ensembled learning.	(Understand)	6
C)	Describe terms: Bagging, Boosting and Stacking.	(Understand)	6
Q. 5	Solve Any Two of the following.		12
A)	Explain clustering with example. State need of clustering.	(Understand)	6
B)	State the working of K-means clustering algorithm.	(Remember)	6
C)	Differentiate between Agglomerative and Divisive hierarchical clustering.	(Analyze)	6

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary End Semester Examination – Summer 2023

Course: B. Tech. Branch: Computer Semester: VI

Subject Code & Name: BTCOE603(C) Internet of Things

Max Marks: 60 Date: 18/07/2023 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	Solve All Two of the following.		
A)	Explain the basic architecture of IoT network.	(L1/ CO1)	6 M
B)	Explain in detail the Core IoT Functional Stack	(L1/ CO1)	6 M
Q.2	Solve Any Two of the following.		
A)	What is M2M communication? Justify the statement with an illustrative scenario: "IoT is much more than M2M communication".	(L2/ CO2)	6 M
B)	Enlighten new trends in IoT smart object.	(L2/ CO2)	6 M
C)	Describe an example of IoT services that uses publish-subscribe model.	(L2/ CO2)	6 M
Q. 3	Solve any two of the following.		
A)	Describe the challenges and opportunities of data management in IoT.	(L3/ CO3)	6 M
B)	Explain manageable and highly secure key advantages of the IP suite for the Internet of Things.	(L3/ CO3)	6 M
C)	Explain Optimizing IP for IoT in brief with the help of a neat and labeled diagram.	(L3/ CO3)	6 M
Q.4	Solve All Two of the following.		
A)	Explain in detail supervised and unsupervised machine learning.	(L2/ CO4)	6 M
B)	Why IoT is important in Neural Network. Explain in detail.	(L2/ CO4)	6 M
Q. 5	Solve Any Two of the following.		
A)	Difference between Raspberry-Pi and Arduino device	(L3/ CO5)	6 M
B)	Explain working of temperature sensor using Raspberry-Pi.	(L2/ CO5)	6 M
C)	Describe the IoT cloud based smart city services.	(L3/ CO5)	6 M

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. Branch : Computer Science & Engineering

Semester : VI

Subject Code & Name: BTCOE604B - Internet of Things

Max Marks: 60 **Date: /07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Differentiate between IT and OT networks.	(Understand)	**6**
B)	Draw and explain core IoT functional Stack.	(Understand)	**6**
C)	Draw & explain IoT World Forum (IoTWF) Standardized Architecture.	(Understand)	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Explain different types of sensors.	(Remember)	**6**
B)	Explain components of smart objects.	(Understand)	**6**
C)	Describe various Communications Criteria.	(Understand)	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Explain Key Advantages of Internet Protocol.	(Remember)	**6**
B)	Discuss Message Queuing Telemetry Transport (MQTT).	(Understand)	**6**
C)	Illustrate any two techniques of IP Optimization for IoT.	(Application)	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	What is HDFS in Hadoop? Explain namenode and datanode.	(Understand)	**6**
B)	What is Machine Learning? Explain the role of Machine Learning in IoT.	(Understand)	**6**
C)	What is Edge analytics? Describe Edge Analytics Core Functions.	(Understand)	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	Illustrate basic structure of Arduino programming with LED blink program?	(Application)	**6**
B)	What is Raspberry pi? Draw hardware layout of raspberry pi.	(Remember)	**6**
C)	What is Temperature Sensor? Draw interfacing of any one temperature sensor with Arduino with code.	(Remember)	**6**

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch: Computer** **Semester: VI**

Subject Code & Name: BTHM605C Consumer Behavior

Max Marks: 60 **Date: 21/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *Use of non-programmable scientific calculators is allowed.*
3. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	Solve Any Two of the following.		12
A)	Define consumer behavior & explain basic components of it.	CO1	6
B)	Explain the interdisciplinary nature of consumer behavior.	CO2	6
C)	Write the difference between quantitative & qualitative approach.	CO3	6
Q.2	Solve Any Two of the following.		12
A)	What is market segmentation? Write the requirements for effective segmentation?	CO1	6
B)	Explain the difference between EPS & RPS.	CO3	6
C)	What is positioning? Write various positioning strategies.	CO1	6
Q. 3	Solve Any Two of the following.		12
A)	Explain the economic model of consumer behavior.	CO1	6
B)	Explain the Nicosia model of consumer behavior.	CO1	6
C)	Explain the Engel-Kollat-Blackwell model of consumer behavior.	CO1	6
Q.4	Solve Any Two of the following.		12
A)	What are the various consumer needs reference to Maslow's hierarchy?	CO2	6
B)	Explain the different types of consumer groups.	CO1	6
C)	What is opinion leadership? What are the characteristics of it?	CO1	6
Q. 5	Solve Any Two of the following.		12
A)	What is diffusion of innovation? Explain diffusion process.	CO2	6
B)	Write the difference between organizational & consumer buying.	CO3	6
C)	Write note on consumer behavior & promotion strategy.	CO1	6
	*** End ***		

TY- Computer

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech.Branch : Computer Science & Engineering **Semester : VI**

Subject Code & Name: BTCOC601 - Compiler Design

Max Marks: 60 **Date:12/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Draw a neat diagram and explain different phases of compiler. Differentiate between Interpreter, Compiler and Hybrid compiler.	Remembering	**6**

B)	Define token, pattern, and lexeme with suitable examples. Find tokens, pattern and lexemes forthe following C- program. Give reasonable attribute values for the tokens.
	
	int main()
	{
	int a = 10, b = 20;
	printf ("Sum is : %d", a+b);
	return (0)
	}
		Remembering	**6**

C)	i) Explain regular expression and regular definition with example. ii) Write regular definitions for the following languages: 1. All strings of lowercase letters that contain the five vowels in order. 2. All strings of lowercase letters in which the letters are in ascending lexicographic order.	Analyzing	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Explain the two buffer input scheme for scanning the source program in lexical analyzer? How the use of sentinels can improve its performance?	Remembering	**6**
B)	i) Explain the role of finite automata in lexical analyzer and differentiate between NFA and DFA. ii) Convert the following regular expression to NFA using Thompson Construction algorithm. (a|b*ab)*	Applying	**6**
C)	Convert the following NFA to DFA using subset construction algorithm. ((01| 0) 1*)*	Remembering Analyzing	**6**
Q.3	**Solve Any Two of the following.**		**12**

A)	i) What is left recursion and left factoring? ii) Consider the CFG S→SS+| SS* | a a) Left factor this grammar. b) Eliminate the left recursion from the original grammar. c) Is the resulting grammar suitable for top-down parsing?	Remembering	6
B)	What is the difference between recursive–descent parsing and predictive parsing?Draw and explain the model of non recursive predictive parser.	Remembering Applying	6
C)	What is LL(1) grammar? Construct a **LL(1)** parsing table for the following grammar. Test whether following grammar is**LL(1).** S → aAB|bA|c A → aAb |e B → bB |c	Applying	6
Q.4	**Solve Any Two of the following.**		12
A)	Explain stack implementation of shift reduce parsing with their four possible actions. Consider the following grammar S → TL T → int | float L → L,id | id Parse the input string **int id, id** using shift – reduce parser.	Understanding, Applying	6
B)	i) Differentiate between LR(0) and LR(1) grammar with suitable example. ii)What is handle? Consider the following grammar and show the handle of each right sentential form for the string (a ,(a , a)). S→ (L)|a L → L ,S |S	Applying Analyzing	6
C)	Show that following grammar is LL(1) but not SLR(1). S→ AaAb | BbBa A →ε B→ε	Applying	6
Q.5	**Solve Any Two of the following.**		
A)	For the SDD given below, give annotated parse tree for the expression **3*5+4**	Applying	6

	<table><tr><th>PRODUCTION</th><th>SEMANTIC RULES</th></tr><tr><td>1) $L \rightarrow E$ n</td><td>$L.val = E.val$</td></tr><tr><td>2) $E \rightarrow E_1 + T$</td><td>$E.val = E_1.val + T.val$</td></tr><tr><td>3) $E \rightarrow T$</td><td>$E.val = T.val$</td></tr><tr><td>4) $T \rightarrow T_1 * F$</td><td>$T.val = T_1.val \times F.val$</td></tr><tr><td>5) $T \rightarrow F$</td><td>$T.val = F.val$</td></tr><tr><td>6) $F \rightarrow (E)$</td><td>$F.val = E.val$</td></tr><tr><td>7) $F \rightarrow$ digit</td><td>$F.val =$ digit.lexval</td></tr></table>		
B)	List the issues in designing code generator. Generate code for the following three-address statements assuming all variables are stored in memory locations. x = b * c y = a + x	Applying	6
C)	Define basic block and flow graph. Give basic blocks and flow graph for the following sequence of three address code statements: (1) prod := 0 (2) i := 1 (3) t_1 := 4* i (4) t_2 := a[t_1] /*compute a[i] */ (5) t_3 := 4* i (6) t_4 := b[t_3] /*compute b[i] */ (7) t_5 := t_2*t_4 (8) t_6 := prod+t_5 (9) prod := t_6 (10) t_7 := i+1 (11) i := t_7 (12) if i<=20 goto (3)	Remembering Understanding	6
	*** End ***		

The grid and the borders of the table will be hidden before final printing.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2023

Course: B. Tech. **Branch: Civil Engineering** **Semester: VI**

Subject Code & Name: BTCVC602 ***Foundation Engineering***

Max Marks: 60 **Date:14/07/2023** **Time: 2:00 to 5:00 PM**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve <u>any two</u> of the following.**		**12**
A)	What are the stages of site investigation? State objectives of each stage?		**06**
B)	Describe, with a neat sketch, the wash boring method. In what field conditions would you recommend this method?		**06**
C)	**C.1)** A SPT was conducted in a dense sand deposit at a depth of 22 m, and a value of 48 was observed for N. The density of the sand was 15 kN/m^2. What is the value of N, corrected for overburden pressure? **C.2)** Compute the area ratio of a thin-walled tube samples having an external diameter of 6 cm and a wall thickness of 2.25 mm. Do you recommend the sampler for obtaining undisturbed soil samples? Why?		**06**
Q.2	**Solve <u>any two</u> following questions.**		**12**
A)	What are the common modes of bearing capacity failure of a footing. Explain in detail with Sketches?		**06**
B)	A strip footing of width 3 m is founded at a depth of 2 m below the ground surface in a (c - ϕ) soil having a cohesion c = 30 kN/m^2 and angle of shearing resistance $\phi = 35°$. The water table is at a depth of 5 m below ground level. The moist weight of soil above the water table is 17.2 5 kN/m^3. Determine (a) Ultimate bearing capacity of the soil, (b) Net bearing capacity, and (c) Net allowable bearing pressure and the load/m for a factor of safety of 3. Use the general shear failure theory of Terzaghi. $\emptyset = 35^0$ $N_c = 57.8, N_q = 41.4$ and $N\gamma = 42.4$		**06**
C)	If the water table in Q.2 B) rises to the ground level, determine the **net safe bearing pressure** of the footing. All the other data given in Q.2 B) remains the same. Assume the saturated unit weight of the soil γ_{Sat} is 18.5 kN/m^3.		**06**

Q. 3 Solve <u>any two</u> of the following. 12

A) What is swelling soils? Explain in detail the characteristics of swelling soils? 06

B) Define and explain the following terms: 06

A) Swelling Potential B) Swelling Pressure C) Free Swell

C) Enlist & explain the essential steps involved in the final choice of the type of foundation? 06

Q.4 Solve <u>any two</u> of the following. 12

A) Classify and explain the types of Piles: 06

a) Based on purpose

b) Based on load transfer

c) Based on method of construction

B) Enlist the different methods to estimate the load carrying capacity of piles and explain in detail static formulae method. 06

C) **C.1)** A timber pile was driven by a **drop hammer** weighing 30 kN with a free fall of 1.2 m. The average penetration of the last few blows was 5 mm. What is the **capacity of the pile** according to Engineering News Formula? 06

C.2) A pile is driven with a single acting **steam hammer** of weight 15 kN with a free fall of 900 mm. The final set, the average of the last three blows, is 27.5 mm. Find the **safe load** using the Engineering News Formula?

Q. 5 Solve <u>any two</u> of the following. 12

A) Enlist the different methods for the analysis of finite slopes and explain in detail the stability number method. 06

B) Enlist and explain in detail the different types of slope failures? 06

C) An embankment is inclined at an angle of 35° and its height is 15 m. The angle of shearing resistance is 15° and the cohesion intercept is 200 kN/m^2. The unit weight of soil is18.0 kN/m^3. If Taylor's stability number is 0.06, find the factor of safety with respect to cohesion. 06

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Examination – Summer 2023

Course: B. Tech. **Branch: Civil Engineering** **Semester: VI**

Subject Code & Name: BTCVC602 ***Foundation Engineering***

Max Marks: 60 **Date:15/07/2023** **Time: 2:00 to 5:00 PM**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level)	Marks
Q. 1	**Solve <u>any two</u> of the following.**		**12**
A)	What is Standard Penetration Test? Explain it in detail?	**Understand**	**06**
B)	Enlist & explain the geophysical methods of soil exploration?	**Remember**	**06**
C)	**C.1)** The following dimensions are given for a shelby tube sampler: External diameter = 51 mm; Internal diameter = 48 mm. Determine the area ratio?	**Apply**	**06**
	C.2) 75 mm is the external diameter of sampling tube. If the area ratio required is 20% determine the thickness of sampling tube? In what type of clay would such a high area ratio be required?		
Q.2	**Solve <u>any two</u> following questions.**		**12**
A)	What are the assumptions in Terzaghi's bearing capacity theory? Explain the bearing capacity equation given by Terzaghi based on general shear failure.	**Understand**	**06**
B)	A strip footing of width 3 m is founded at a depth of 2 m below the ground surface in a (c - ϕ) soil having a cohesion c = 30 kN/m^2 and angle of shearing resistance $\phi = 35°$. The water table is at a depth of 5 m below ground level. The moist weight of soil above the water table is 17.2 5 kN/m^3. Determine (a) Ultimate bearing capacity of the soil, (b) Net bearing capacity, and (c) Net allowable bearing pressure and the load/m for a factor of safety of 3. Use the general shear failure theory of Terzaghi. $\emptyset = 35^0$ $N_c = 57.8, N_q = 41.4$ and $N\gamma = 42.4$	**Apply**	**06**
C)	If the water table in Q.2 B) rises to 1.25 m below the ground level and 1.25 m below the base of foundation, determine the **net safe bearing pressure** of the footing. All the other data given in Q.2 B) remains the same. Assume the saturated unit weight of the soil γ_{Sat} is 18.5 kN/m^3 $\gamma\,(above\ WT) = 17.5\ kN/m^3$.	**Evaluate**	**06**

Q. 3 Solve any two of the following.

A)	What is expansive soils? Explain in detail the characteristics of expansive soils?	Remember	12
B)	Define and explain the following terms: A) Swelling Potential B) Swelling Pressure C) Free Swell	Remember	06 06
C)	Explain in detail the IS Code of method for design of raft foundation.	Understand	06

Q.4 Solve any two of the following.

A)	Explain in detail the concept of Negative Skin Friction?	Understand	12
B)	Enlist the different methods to estimate the load carrying capacity of piles and explain in detail dynamic formulae method.	Understand	06 06
C)	**C.1)** A timber pile was driven by a drop hammer weighing 30 kN with a free fall of 1.2 m. The average penetration of the last few blows was 5 mm. What is the capacity of the pile according to Engineering News Formula? **C.2)** A pile is driven with a single acting steam hammer of weight 15 kN with a free fall of 900 mm. The final set, the average of the last three blows, is 27.5 mm. Find the safe load using the Engineering News Formula?	Evaluate	06

Q. 5 Solve any two of the following.

A)	Enlist the different methods for the analysis of finite slopes and explain in detail the stability number method.	Understand	12 06
B)	Enlist and explain in detail the different types of slope failures?	Understand	06
C)	An embankment is inclined at an angle of 35° and its height is 15 m. The angle of shearing resistance is 15° and the cohesion intercept is 200 kN/m^2. The unit weight of soil is18.0 kN/m^3. If Taylor's stability number is 0.06, find the factor of safety with respect to cohesion.	Evaluate	06

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Summer Examination – 2023

Course: B. Tech. **Branch :Civil Engineering** **Semester :VI**

Subject Code & Name:BTCVC603 **Transportation Engineering**

Max Marks: 60 **Date:17/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Explain- Stages of Engineering Survey for highways	**CO1**	**6**
B)	Why the Jayakar committee was formed? Also state various recommendations of Jayakar committee.	**CO1**	**6**
C)	Explain in detail- i) Camber ii) Classification of camber based on shape iii) Various values of camber for different types of road.	**CO2**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	The radius of horizontal curve is 400m, the total pavement width at curve is 7.6m (including extra widening) and the super elevation is 0.07. Check the safety against transverse skidding and calculate the transition curve length for a speed of 100kmph by using "allowable rate of introduction of super elevation" criteria **ONLY**. Assume pavement to be rotated about the inner edge and rate of introduction of super elevation is 1 in 150.	**CO1**	**6**
B)	i) Define- Elongation Index and Flakiness Index ii) Explain the procedure of Flash and fire test of bitumen	**CO2**	**6**
C)	Explain California Bearing ratio test on Subgrade	**CO2**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	i) Write a short note on Road Arboriculture. ii) Give the difference between Tar and Bitumen.	**CO3**	**6**
B)	Descending grade of 1 in 30 and ascending grade of 1 in 40 meet to form valley curve. Design a valley curve for fulfillment of comfort criteria and head light sight distance criteria if design speed is 70 kmph, f=0.35 and braking time is 2.5 sec, allowable rate of change of acceleration is $0.6 m/sec^3$	**CO3**	**6**
C)	Explain road intersections at grade with neat sketches.		**6**

Q.4 Solve Any Two of the following.

A) The speed of overtaking and overtaken vehicles is 80 and 50 kmph respectively on a two way traffic road. The average acceleration during overtaking may be assumed as 0.90m/sec^2 and length of wheel base is 6m. Calculate safe overtaking sight distance for two way traffic. **CO4**

B) Give a short note on **CO3**

Accident -its classification and causes

C) Explain **CO3**

i) Traffic capacity and its types

ii) Urban road classification

Q. 5 Solve Any Two of the following

A) Give the difference between flexible pavements and Rigid pavements **CO3**

B) Define Intelligent Transport System (ITS) and give some examples of Intelligent Transport System (ITS) in India. **CO4**

C) Calculate radius of relative stiffness and radius of equivalent resisting section of a cement concrete pavement by using following data. **CO4**

Wheel load = 5100kg, Modulus of elasticity of concrete (E) = $3*10^5$ kg/cm^2, Pavement thickness(h) = 18cm, Poisson's ratio of concrete (μ)=0.15, Modulus of subgrade reaction(K)=6 kg/cm^3, Radius of contact area(a)=15cm

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2023

Course: B. Tech. **Branch: Civil Engineering** **Semester: VI**

Subject Code & Name: BTCVC403 ***Structural Mechanics - I***

Max Marks: 60 **Date:18/07/2023** **Time: 2:00 to 5:00 PM**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve <u>any two</u> of the following.**		**12**
A)	A simply supported beam of span 4 m is carrying a UDL of 2 kN/m over the entire span. Find the maximum slope and deflection of the beam. Take EI for the beam as 80×10^9 N-mm^2.	**CO2**	**06**
B)	A cantilever of length '2a' is carrying a load of '*W*' at the free end and another load of '*W*' at its centre. Determine the slope and deflection of cantilever at free end.	**CO2**	**06**
C)	Enlist the different methods to find deflection in beams and explain in detail double integration method?	**CO2**	**06**
Q.2	**Solve <u>any two</u> following questions.**		**12**
A)	Define the terms: a) Strain Energy, b) Strain Energy Density and c) Castigliano's theorems	**CO2**	**06**
B)	Use strain energy method & determine the deflection at the free end of a cantilever beam of length 'L subjected to point load P at the free end.	**CO2**	**06**
C)	A simply supported beam of span 6 m & M.I. as $2I_o$ with one side as overhanging of span 2 m with M.I. as I_o. Beam is subjected to UDL of 45 kN/m throughout the span. Determine the deflection of free end of overhanging beam. Use Unit load method.	**CO2**	**06**
Q. 3	**Solve <u>any two</u> of the following.**		**12**
A)	Determine static indeterminacy & elastic curve of below beams: a) Simply supported beam subjected to UDL throughout the span. b) Cantilever beam subjected to point load at free end. c) Fixed beam subjected central point load.	**CO1**	**06**
B)	Determine the reaction components of propped cantilever of span L subjected to uniformly distributed load *w/unit length.*	**CO1**	**06**
C)	A fixed beam of span 'L' subjected to UDL 'w' kN/m throughout the span. Find SFD and BMD. Locate point of contraflexture. Also find the maximum deflection. Flextural rigidity 'EI' is constant.	**CO1**	**06**

Q.4 Solve <u>any two</u> of the following.

A) State and explain theorem of three moments (Clapeyron's theorem) for analysis of two span continuous beam simply supported ends. Each span of length L, M.I. as I, EI as flexural rigidity. **CO4**

B) Two span continuous beam ABC of span AB 2 m & span BC 2 m. Span AB is subjected to UDL of 50 kN/m. Span BC is subjected 40 kN at distance 0.5 m from C. Draw SFD and BMD. **CO4**

C) Define & explain the following terms: **CO4**

A) Carry over moment
B) Carry over factor
C) Stiffness factor

Q. 5 Solve <u>any two</u> of the following.

A) State and explain the assumptions made in slope deflection method (SDM) while developing this method. **CO3**

B) Analyse the two-span continuous beam ABC by slope deflection method having both ends as fixed one. Span AB is having 4 m length, M.I. as 'I' & subjected central point load of 40 kN. Span BC is having 6 m length, M.I. as '2I' & subjected to UDL of 20 kN/m over entire span BC. Draw SFD & BMD. **CO3**

C) Analyse the two-span continuous beam ABC by slope deflection method having one end as fixed one & other end as roller support. Span AB is having 6 m length, M.I. as 'I' & subjected point load of 60 kN at distance of 4m from fixed support A. Span BC is having 6 m length, M.I. as 'I' & subjected to UDL of 30 kN/m over entire span BC. Draw BMD. **CO3**

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Examination – Summer 2023

Course: B. Tech. Branch: Civil Engineering Semester :6th Sem

Subject Code & Name: BTCVC603_Concrete technology

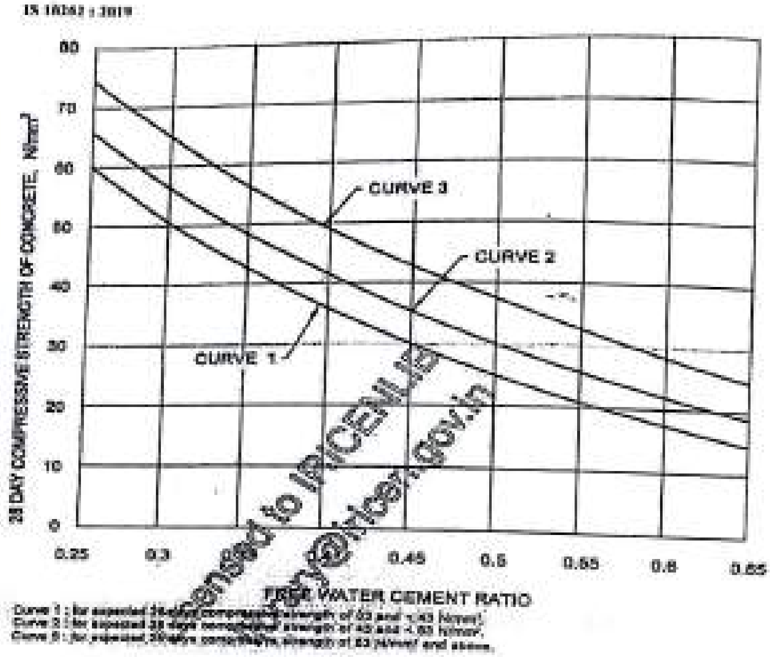
Max Marks: 60 Date:18/07/2023 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/ CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	List the properties of coarse aggregate and explain one of them in detail.	CO1	6
B)	Define bulking of sand and explain in detail the procedure to find the bulking of sand with diagram.	CO1	6
C)	Explain the procedure to determine Initial Setting time of cement.	CO1	6
Q.2	**Solve Any Two of the following.**		
A)	Describe the procedure for determination of workability by slump cone test diagram.	CO1	6
B)	Explain the procedure of conducting a rebound hammer test for measuring the surface hardness with diagram.	CO1	6
C)	Define the following terms :a) Setting time of cement b) Creep c) Shrinkage d) Durability e) Green Concrete f) Consistency of cement	CO1	6
Q. 3	**Solve Any Two of the following.**		
A)	Define Plasticizers and Super-plasticizers and state their Effects On Workability	CO2	6
B)	Write a short note on Alkali Aggregate Reaction (AAR) & Explain factors affecting on Alkali Aggregate Reaction.	CO3	6
C)	Calculate fineness modulus for the given data of fine aggregate. Total weight of C.A. = 1000 gm. State type of sand.	CO1	6

Sieve size (mm)	4.75	2.36	1.18	600µ	300µ	150µ	Pan
Weight retained (gm.)	100	150	300	200	120	90	40



*** End ***

The grid and the borders of the table will be hidden before final printing.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2023

Course: B. Tech. **Branch: Civil Engineering** **Semester: VI**

Subject Code & Name: BTCVPE604F Structural Audit

Max Marks: 60 **Date:19/07/23** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	What is the scope of Visual inspection? Enlist the key factors which are keenly observed during visual inspection.	**III**	**6**
B)	Write a detail note on factors affecting distressing of Concrete.	**II**	**6**
C)	Define Structural Audit. Enlist the Objectives of Structural audit.	**II**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Define Micro and Macro Cracks. Which are the Causes of Micro and Macro cracks?	**III**	**6**
B)	Write a detail note on Alkali- Silica reaction and Sulphate attack.	**II**	**6**
C)	Which are the Causes of deterioration in steel structures.	**II**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Which are the elementary aspects considered during NDT of Existing Structures.	**II 6**	
B)	Write a note on following equipment's used for concrete strength assessment during NDT a) Rebound Hammer b) Ultrasonic Pulse Velocity	**V**	**6**
C)	Write a note on following equipment's used for chemical strength assessment during NDT a) Carbonation test b) X ray diffraction	**V**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	Write a detailed note on Strength evaluation of existing structure.	**IV**	**6**
B)	Define Reserve Strength. Which parameters are considered while identification of critical sections during Structural Audit?	**III 6**	
C)	Which are the Causes of deterioration in R.C.C. structures.	**II**	**6**

Q. 5 Solve Any Two of the following.

A) Write a detail note on various stages involved in structural Audit. II

B) Write a sample Structural Audit Report for up-gradation of existing building. V

C) Write a sample Structural Audit Report for Old school building for continuation of its usage. V

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2023

Course: B. Tech. Branch: Civil Engineering **Semester :6th Sem**

Subject Code & Name: BTCVPE6041 (NUMERICAL METHODS IN CIVIL ENGINEERING)

Max Marks: 60 **Date:19.07.2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level /CO)	Mark
Q. 1	**Solve Any Two of the following.**		12
A)	Solve , following system of equations by Gauss Seidal method, $20x+y-2z = 17,\ 3x+20y-z = -18,\ 2x-3y+20z = 25.$	CO1	6
B)	Solve by Choleskey decomposition method, $25x + 15y - 5z = 35;\quad 15x + 18y + 0z = 33;\quad -5x + 0z + 11z = 6.$	CO1	6
C)	Explain the steps involved in Gauss Elimination method.	CO1	6
Q.2	**Solve Any Two of the following.**		12
A)	Solve for a positive root of $x - \cos x = 0$ by Secant method.	CO1	6
B)	Derive the Euler's formula.	CO1	6
C)	Using Runge – Kutta method of fourth order, solve $dy/dx = (y^2 - x^2)/(y^2 + x^2)$ with $y(0) = 1$ at $x = 0.2, 0.4$	CO1	6
Q. 3	**Solve Any Two of the following.**		12
A)	Using the finite difference method , find y (0.25), y(0.5), y (0.75) satisfying the differential equation $y'' + y = x$, subject to the boundary conditions $y(0) = 0$ and $y(1) = 1$.	CO2	6
B)	From the following table find f(x) and hence find f(6) using Newton's interpolation formula. x : 1 2 7 8 f(x) : 1 5 5 4	CO3	6
C)	Derive Lagrange's interpolation formula.	CO1	6

Q.4	**Solve Any Two of the following.**		
A)	Using trapezoidal rule evaluate the integral $\int_0^{(}$ dx/(1 + x2) with h=0.2. Hence obtain an approximate value of π.	**CO 3**	
B)	Evaluate $\int_0^{"}$ sinx dx by Simpson's rule.	**CO 3**	
C)	Use Gaussian three –point formula and evaluate $\int_1^{5} \frac{dx}{x}$	**CO1**	
Q. 5	**Solve the following.**		
A)	Fit the curve of the form $y = ab^x$ X 1 2 3 4 5 6 Y 151 100 61 50 20 8	**CO3**	
B)	Explain standard deviation and measures of dispersion.	**CO2**	6
C)	Define mean ,mode and median with example.	**CO1**	6
	***** End *****		

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Summer Examination – 2022-23

Course: B. Tech. **Branch: Civil Engineering** **Semester: VI**

Subject Code & Name: BTCVOE605C Business Communication & Presentation Skill

Max Marks: 60 **Date: 21/7/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Write a note on business communication.	CO1	6
B)	Discuss computer aids in business communication.	CO1	6
C)	Write an application letter seeking permission for technical competition.	CO1	6
Q.2	**Solve Any Two of the following.**		**12**
A)	Discuss components of a project report.	CO2	6
B)	Write a 3D construction project proposal.	CO2	6
C)	Write a project report on construction of shopping complex.	CO2	6
Q. 3	**Solve Any Two of the following.**		**12**
A)	Illustrate leadership and leadership skills.	CO2	6
B)	Write a note on emotional intelligence.	CO2	6
C)	Discuss necessity of team working.	CO2	6
Q.4	**Solve Any Two of the following.**		**12**
A)	Discuss role of business meetings.	CO2	6
B)	Explain significance of minutes of meeting.	CO2	6
C)	Write meeting agenda for a annual financial meeting.	CO2	6
Q. 5	**Solve Any Two of the following.**		**12**
A)	Write a note on presentation tools.	CO3	6
B)	Discuss various presentation methods.	CO3	6
C)	Discuss roles of presentations in business.	CO3	6

**** END ****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary End Semester Examination – Summer 2023

Course: B. Tech. Branch: Civil Engineering Semester: VIth

Subject Code & Name: BTCVE605D Advanced Engineering Geology

Max Marks: 60 Date: 22/07/2023 Duration: 3.00 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	Write short notes on: - a. Mobile belts b. Law of Superposition c. Blocky lava flows	(CO1)	6
B)	Write a detailed note on geological time scale and its application.	(CO1)	6
C)	Explain in detail lithostratigraphic successions of Deccan Traps and its feasibility.	(CO1)	6
Q.2	**Solve Any Two of the following.**		
A)	Write a short note on: - a. Confined aquifer b. Porosity and its types c. Non-representative sampling	(CO2)	6
B)	Explain detail the division of sub-surface water with a neat labeled diagram.	(CO2)	6
C)	Give detail account of Rock Mass Rating with its merits and demerits.	(CO2)	6
Q. 3	**Solve Any Two of the following.**		
A)	Write a short note on: - a. Laterite b. Percolation tank c. Red bole bed	(CO1)	6
B)	Write a note on merits and demerits of using laterites as a building stone.	(CO1)	6
C)	Explain the properties of various types of basalts with their engineering properties.	(CO3)	6

Q.4 Solve Any Two of the following. (CO1) 6

A) Write a short note on: -

a. Pedalfer

b. Soil profile

c. Seismic method

B) Explain the working and applications of earth electric resistivity meter. (CO3) 6

C) What are the differences between transported and residual soil? (CO2) 6

Q. 5 Solve Any Two of the following. (CO4) 6

A) Write a short note on: -

a. Richter Scale

b. Koyana earthquakes

c. Landslide

B) Explain various theories behind earthquake observed nearby Killari. (CO3) 6

C) What are the major reasons behind the origin of earthquakes? (CO4) 6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Summer Examination – 2023

Course: B. Tech. **Branch: Civil Engineering** **Semester: VI**

Subject Code & Name: BTCVC606 Building Planning & Design

Max Marks: 60 **Date:24/07/23** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Write a note on principles of building planning.		6
B)	Explain sun-wind diagram with neat sketch.		6
C)	Explain green building concepts during construction stage.		6
Q.2	**Solve Any Two of the following.**		**12**
A)	Enlist important bye laws as per SP 7.		6
B)	Discuss any six standard dimensions of building components.		6
C)	Write a note on process of obtaining commencement certificate.		6
Q. 3	**Solve Any Two of the following.**		**12**
A)	Explain use of timber in building construction.		6
B)	Write a note on low-cost building materials.		6
C)	Discuss significance of lime as a building material.		6
Q.4	**Solve Any Two of the following.**		**12**
A)	Enlist principles of rainwater harvesting.		6
B)	Draw drainage plan of a house.		6
C)	Write a note on fire resistance of buildings.		6
Q. 5	**Solve Any Two of the following.**		**12**
A)	Explain functional requirements of building ventilation.		6
B)	Illustrate noise prevention at its source.		6
C)	Explain acceptable noise levels for buildings.		6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Summer Examination – 2023

Course: B. Tech. **Branch: Civil Engineering** **Semester: VI**

Subject Code & Name: BTCVC604 Project Management

Max Marks: 60 **Date:26/07/23** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Discuss Project Management in detail.		6
B)	Differentiate between Bar chart and Milestone chart in detail.		6
C)	Determine the Project Duration (Days) and Critical Path for the following:		6

Activity	A	B	C	D	E	F
Predecessor	-	A	A	B	C	D, E
Duration	3	5	7	10	5	4

Q.2	**Solve Any Two of the following.**		**12**
A)	Discuss methods of network compression in detail.		6
B)	Find the Project Duration (Days) and Project Cost (Rs.).		6

Activity	Normal Time	Crash Time	Normal Cost	Crash Cost
1-2	5	3	5000	10000
1-3	2	1	1500	3000
2-4	5	3	2000	3000
2-5	7	3	5000	8000
3-5	6	3	8000	10000
4-6	8	4	5000	6000
5-6	9	5	15000	18000

C) Crash the network given in Q. 2 (B) 6

Q. 3	**Solve Any Two of the following.**		**12**
A)	Discuss central limit theorem in detail.		6
B)	Draw the network and Determine the Project Duration.		6

Activity	Optimistic Time	Most likely time	Pessimistic time

1-2	6	10	20
1-3	7	10	13
2-4	9	15	21
2-5	7	11	15
3-5	3	7	11
4-6	9	12	15
5-6	7	9	11

C) Find the Z value if the Project mentioned in Q.3 B. has to be completed in 22 days. 6

Q.4 Solve Any Two of the following. 12

A) Explain Demand and Supply curve, Inflation and Cash flow diagram. 6

B) Explain methods of economic comparison. 6

C) Explain various interest formulae. 6

Q. 5 Solve Any Two of the following. 12

A) Fixed Cost associated with a product is 50 Lakhs, variable cost is Rs. 25 and the revenue from each item is Rs. 50. Calculate the Break-even quantity if the targeted profit is Rs. 10 Lakhs. 6

B) Discuss Quality control charts in detail. 6

C) Explain ISO 14000 in detail. 6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Summer Examination – 2023

Course: B. Tech. **Branch : Civil** **Semester : VI**

Subject Code & Name: BTCVC601 Design of RC Structures (DRCS)

Max Marks: 60 **Date: 12/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		12
A)	Differentiate between Working stress method and Limit State Method	CO-1	6
B)	Explain different types of loads acting on RC Structure with there IS code Provision.	CO-4	6
C)	Explain Stress strain behavior of Steel & Concrete.	CO-1	6
Q.2	**Solve Any Two of the following.**		12
A)	Explain the Concept of Under Reinforced, Balanced & Over Reinforced Section.	CO-1	6
B)	An RC Beam 300mm wide & 700 mm deep overall is reinforced with 20mm-3 bars. The centers of bars are 50 mm from underside of beam. The maximum stresses are not to exceed 7 N/mm^2 for Concrete and 190 N/mm^2 for steel. By using Working stress method, Find Moment of Resistance and Safely distributed load the beam can carry. Span is 6m & Weight of concrete is 25 KN/m^3.Use Working State Method.(WSM)	CO-3	6
C)	Design the Reinforcement for RC column of a 350 mm x 450 mm in cross section to carry axial load 1000KN.Assume grade of concrete M-20 and Steel Fe415. Permissible stresses in Steel and Concrete are 190 N/mm^2 & 5 N/mm^2.Use Working Stress Method.(WSM)	CO-2	6
Q. 3	**Solve Any Two of the following.**		12
A)	Explain the term – a) Load Factor b) Limit State c) Partial Safety Factor	CO-1	6

B)	Design Shear Reinforcement for beam of size 250 mm x 440 mm overall with cover 40 mm of span 4.25m carries udl 17.5 KN/m including self-weight. Beam is reinforced with 3-16 mm diameter bar. Use M20 Concrete and Fe 415 grade steel. Use Limit State Method.(LSM)	CO-2	6
C)	Find Lap length for bars of 18mm diameter in tension as well compression. Use M20 Concrete & Fe500 grade Steel, Take τbd = 1.2 N/mm^2. Use Limit State Method.	CO-2	6
Q.4	**Solve Any Two of the following.**		**12**
A)	A Hall has dimensions 3m x 9m with wall thickness 230mm. The live load on slab is 3 KN/m^2 & finishing load of 1 KN/m^2 may be assumed. Using M20 grade concrete & Fe 415 grade Steel, Design Slab. Use Limit State Method.	CO-2	6
B)	A T-Beam has permissible effective flange width 1500 mm. Thickness of floor slab 120mm & width of rib is 300mm, effective depth of section 500 mm is reinforced with 4-25mmϕ .Calculate factored moment of Resistance. Use M25 Concrete & Fe 415 Grade Steel. Use Limit State Method.	CO-3	6
C)	State and Explain different parts of Staircase with neat sketch.	CO-3	6
Q. 5	**Solve Any Two of the following.**		**12**
A)	Design a Column , 4m long restrained in position & direction at both ends to carry an axial load of 1600 KN. Use M20 Concrete & Fe415 grade Steel. Use Limit State Method.	CO-2	6
B)	Explain with neat sketch importance of Interaction diagram for uniaxial bending & Axially Compression member.	CO-3	6
C)	Define Footing. Explain different types of Footing.	CO-2	6
	*** End ***		

TY- civil

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Examination – Summer 2023

Course: B. Tech. **Branch : Civil Engineering** **Semester VI**

Subject Code & Name: BTCVC601 Design of Concrete Structure-I

Max Marks: 60 **Date:13/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *Each question carries 12 marks...*
2. *Attempt any five questions of the following.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*
5. ***Use IS 456:2000 is allowed***

		Marks
Q. 1	**Solve the following**	**12**
A)	Enlist Assumption for design of member in working stress method?	04
B)	A Singly reinforced concrete beam is 300mm wide and 450mm deep to the center of the tensile reinforcement which consists of 4 bars 16mm diameter. If the safe stresses on concrete and steel are 7 N/mm^2 and 230 N/mm^2 respectively. Find the moment of resistance of the section take m=13.33. **(WSM).**	08
Q.2	**Solve the following.**	**12**
A)	Explain the different loads coming on structure.	04
A)	Design the slab over a room 5m X 7m as per IS code. The slab is supported on masonry wall all round with adequate restraint and the corner are held down. The live load on lab 2000N/m^2. The slab has a bearing of 150mm on supporting walls. Use M20 and fe415. **(WSM).**	08
Q. 3	**Solve the following.**	**12**
A)	Explain the various types of stair case.	04
B)	The main stair of an office building has to locate in a stair measuring 3.5mX5.5m. The vertical distance between the floor 3.75m. Design the stair. Allow a live load of 2000N/m^2 Use M20 and Fe415. **(WSM).**	08
Q.4	**Solve the following.**	**12**
A)	Explain the shallow and deep foundation in detail with their types	04
B)	a square column 500mm X 500mm carries an axial load of 1500kN.Design the column and a square footing for the column. The safe bearing capacity of the soil 225 kN/m^2 use M20 and Fe 415 **(WSM)**	08

Q. 5 Solve the following. 12

A) Find the reinforcement required for a doubly reinforced beam section to the following particulars 08

i. Width of the beam= 250mm
ii. Depth of the beam to the center of the tensile reinforcement= 500mm
iii. Effective cover to the center of compression reinforcement=50mm
iv. Max. bending meomt under the working load condition= 160KNm
v. Safety factor=1.5

Use M20 and Fe250 **(LSM)**

B) Explain limit of collapse and limit state of serviceability 04

Q. 6 Solve the following. 12

A) Explain the Development length and its check. 04

B) A simply supported reinforced beam of 250mm wide and 500mm deep to the center of tensile reinforcement with 4 bars of 20mm Diameter as tensile steel. If the beam is subjected to a factored shear 95kN at the support design the shear reinforcement consisting of stirrups. Use M20 and Fe 415 **(LSM)** 08

**********END**********

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Summer Semester Examination –2023

Branch: Electronics and Telecommunication Engineering **Sem.:- VI**

Subject with Subject Code: - Digital Communication BTETC602 **Marks: 60**

Date:-14/07/2023 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. **ALL** questions are compulsory.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

		(Level)	(Marks)
Q.1	Solve any two questions from the followings:		
A)	Explain Adaptive Delta Modulation with neat diagram. Differentiate between Delta Modulation and Adaptive Delta Modulation.	L1	(06)
B)	A channel with bit rate R_b = 36 kbps is available for PCM voice transmission. Find appropriate values of binary digits N, the number of quantization levels M and the sampling rate f_s, assuming f_m= 3.2 kHz.	L2	(06)
C)	Differentiate between Analog and Digital Communication.	L1	(06)
Q.2	Solve any two questions from the followings:		
A)	Explain Narrow band noise. Explain its Representation in terms of in phase & quadrature components.	L2	(06)
B)	A Television signal with a bandwidth of 4.2 MHz is transmitted using binary PCM. The number of quantization levels is 512. Calculate: 1. Code word length 2. Transmission bandwidth 3. Final bit rate 4. Output signal to quantization noise ratio	L3	(06)
C)	Explain the working of Additive Scramblers.	L1	(06)

Q.3 Solve any two questions from the followings: L3 (06)

A) Write a note on Ergodic Processes. L2 (06)

B) With neat waveforms explain the concept of ISI digital communication? L1 (06)

C) Explain various Data encoding or Line coding techniques.

Q.4 Solve any two questions from the followings: L2 (06)

A) Explain Binary Phase Shift Keying technique with neat waveforms and block diagram. What is the probability of error in BPSK. L3 (06)

B) Consider an LTI system with impulse response h(t). Let X(t) be a WSS random process. If X(t) is the input of the system, then the output, Y(t), is also a random process. If $Y(t) = \int_{-\infty}^{\infty} h(u)X(t-u)du$, then
Prove that :

1. $R_{xy}(\tau) = R_{xx}(\tau) * h(-\tau)$ and
2. $R_{yy}(\tau) = R_{xy}(\tau) * h(\tau)$ where * denotes convolution
3. $S_{xy}(w) = S_{xx}(w)H^*(w)$ and
4. $S_{yy}(w) = S_{xx}(w)|H(w)|^2$

C) Explain the working of OFDM technique. What are its advantages? L1 (06)

Q.5 Solve any two questions from the followings: L2 (06)

A) What is matched filter? Explain its working. L2 (06)

B) Explain Jamming. What are the various types of Jammers? L2 (06)

C) Explain the working of DS-SS Scheme with neat block diagram.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch : E&TC** **Semester : VI**

Subject Code & Name: BTETPE603A- Microprocessors and Microcontrollers

Max Marks: 60 **Date: 17/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Provide a detailed explanation of the flag register of an 8085 microprocessor.	**L6**	**6**

B)	State addressing modes of following instructions of 8085 microprocessor.
	up: LXI H, 1000H
	MOV A, M
	MOV B, A
	ADD B
	STA 1001H
	JMP up
		L3	**6**

C)	State any six differences between CISC and RISC architecture.	**L3**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Explain following instructions with suitable examples of each. (i) ANI 55H (ii) CMP B (iii) SBI 55H	**L6**	**6**
B)	Assume that five numbers are stored from 1000H to 1004H. Write an assembly language program to clear D3 bit of each number.	**L4**	**6**
C)	Draw timing diagram for following instructions of 8085. (i) MOV A, B (ii) MVI A, 55H	**L5**	**6**

Q. 3	**Solve Any Two of the following.**			12
A)	Draw and explain Pin diagram of an 8051 microcontroller.	L6		6
B)	Explain any three addressing modes of 8051 with suitable examples of each.	L6		6
C)	Draw structure of a TMOD register and explain function of each bit of it.	L5		6
Q.4	**Solve Any Two of the following.**			12
A)	Write an 8051 C program to toggle all bits of P2 continuously every 500 ms. Use Timer 1, mode 1 to create the delay.	L4		6
B)	Explain any six pins of RS232 DB-9 connector.	L1		6
C)	Indicate which mode and which timer is selected for each of the following.	L3		6
	i. MOV TMOD, #01H			
	ii. MOVTMOD, #20H			
	iii. MOV TMOD, #12H			
Q. 5	**Solve Any Two of the following.**			12
A)	Write an 8051 C program to send letters 'A', 'B', and 'C' to the LCD using the busy flag method.	L1		6
B)	Explain BSR and Input-Output modes of 8255 with neat diagrams.	L5		6
C)	Explain internal RAM memory structure of an 8051 microcontroller.	L3		6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. Branch :Electronics & Telecommunication

Semester : VI

Subject Code & Name: Computer Network(BTETOE604C)

Max Marks: 60 Date:19/07/2023 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	Solve Any Two of the following.		12
A)	What is OSI Model? Explain functions & services of any two layers.	CO1	6
B)	What are different switching techniques used in computer networks? Discuss.	CO2	6
C)	What is IP addressing? How it is classified?	CO5	6
Q.2	Solve Any Two of the following.		12
A)	What is HDLC? Explain in detail.	CO2	6
B)	What is pure ALOHA & slotted ALOHA? Explain in detail.	CO4	6
C)	Calculate maximum throughput possible for ALOHA & slotted ALOHA for a radio system with 9600bps channel used for call set up request to base station. Let frame length be 200 bits.	CO4	6
Q. 3	Solve Any Two of the following.		12
A)	Explain ARP & RARP in detail	CO2	6
B)	Write short note on Bluetooth.	CO8	6
C)	Find the Class of following IP address. 1) 10.15.20.60 2) 130.1.2.3 3) 150.0.150.150 4) 200.1.10.100 5) 220.15.1.10 6) 250.0.1.2	CO4	6
Q.4	Solve Any Two of the following.		12
A)	A 2km long broadcast LAN has 10^7 bps bandwidth and uses CSMA/CD. The signal travels along the wire at 2×10^8 m/sec. what is the minimum packet size than can be used on this network?	CO4	6
B)	Write a short note on User Datagram Protocol.	CO2	6
C)	What is the difference between IPv4 and IPv6?	CO3	6

Q. 5 Solve Any Two of the following. 12

A) Describe a) www b) HTTP c) EMAIL CO8 6

B) Write short note on Domain Name System. CO8 6

C) What is cryptography? Explain in detail. CO6 6

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. Branch: Electronics and Telecommunication Engineering Semester: VI

Subject Code & Name: BTIDM605 Employability &Skill Development

Max Marks: 60 **Date: 21/07/2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Compare hard skills and soft skills also explain some examples of each.	**CO1**	**6**
B)	State and explain different formats of resumes.	**CO1**	**6**
C)	What are the aspects of professional presentation?	**CO1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Write a short note on 1) Critical thinking 2) Assertiveness 3) Problem-solving	**CO2**	**6**
B)	Explain time management. What is its significance in an IT firm?	**CO2**	**6**
C)	Explain professional etiquette and manners. How it will be useful in any organization?	**CO2**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Write a descriptive paragraph on National Engineer's Day within 250 to 300 words.	**CO3**	**6**
B)	Write a short story in 200 – 250 words, with the help of the cues given below. Give a suitable title to the story. Martin……. a cobbler…….. His son died…… no interest in life……. a religious man reminded that Martin couldn't judge God's ways……. heard a voice…… "Martin! Look out in the street tomorrow, for I shall come"…….. Next morning an old man stood shivering in the cold…… Martin invited him inside……. offered tea……. no one came…….. Next morning a poor woman stood with a baby in her arms….. Martin gave her his bed…….. Food and cabbage soup….. Martin kept on waiting but no one came…….. In the dream…… first saw file old man……. then the woman with the child ……. Martin crossed himself……the Lord had really come to him.	**CO3**	**6**
C)	Write Project Update EMAIL: Share an update on the progress of a Mini project with your respective guide. [Don't mention your personal information in it]	**CO3**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	What are the preparatory steps for job interviews?	**CO4**	**6**

B)	What are the key differences between a resume and a curriculum vitae (CV)?	CO4	6
C)	Write a Cover letter for B.Tech passed out fresher student applying for a Job. [Don't mention your personal information in it]	CO4	6

Q. 5 Solve Any Two of the following. 12

A)	State and explain the problem-solving model in detail.	CO3	6
B)	What are Interpersonal Skills, explain any five with an example.	CO3	6
C)	Explain how to develop an impressive Resume.	CO3	6

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Summer Examination – 2023

Course: B. Tech. Branch : Electronics&Telecommunication Semester :Sixth

Subject Code & Name: BTETOE605E Python Programming

Max Marks: 60 Date: 22/07/2023 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q.1	**Solve Any Two of the following.**		**12**
A)	**Explain the key features of Python?**	**L2/CO1**	**6**
B)	**Explain What are common built in data types in Python?**	**L2/CO1**	**6**
C)	**Explain .py and .pyc files?**	**L2/CO1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	**Describe Arithmetic Operators, Assignment Operators with an examples.**	**L3/CO2**	**6**
B)	**Write a program in python to print sum of n natural numbers**	**L3/CO2**	**6**
C)	**Write a program to check whether the entered number is positive, negative or zero**	**L3/CO2**	**6**
Q.3	**Solve Any Two of the following.**		**12**
A)	**Describe the list data structure supported by Python programming. How elements can be updated and deleted from the list?**	**L3/CO3**	**6**
B)	**Describe the built in Tuple functions available in Python programming with an example.**	**L3/CO3**	**6**
C)	**Describe the set comprehensions and dictionary comprehensions with an example.**	**L3/CO3**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	**How can we use fruitful function in Python ?**	**L3/CO4**	**6**
B)	**How would you use variable length argument in Python ?**	**L3/CO4**	**6**
C)	**How can we use PIP in Python to install package?**	**L3/CO4**	**6**
Q.5	**Solve Any Two of the following.**		**12**
A)	**How can we use class in python programming?**	**L3/CO5**	**6**
B)	**How the constructor method can be used in Python?**	**L3/CO5**	**6**
C)	**How string matching done in Python using regular expression?**	**L3/CO5**	**6**

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Summer Examination – 2023

Course: B. Tech. Branch: Electronics and Telecommunication Engineering Semester: VI

Subject Code & Name: BTETOE605E Python Programming

Max Marks: 60 Date: 22/07/2023 Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	What are variables, and why are they important in programming? Explain how are variables assigned in Python (give example), and what rules govern variable names?	**Apply**	**6**
B)	Why is indentation significant in Python code? Compare an indented Python code block with an equivalent non-indented one	**Analyze**	**6**
C)	What is a REPL, and how does it work in Python programming? How do you access REPL?	**Understand**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Enlist and explain any six built in object (data) types used in the python programming.	**Remember**	**6**
B)	What is the definition of keyword? Enlist any 10 python keywords.	**Remember**	**6**
C)	a) Differentiate between / and // operator. b) Explain the membership and identity operators in Python with example.	**Analyze**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Give the syntax of the function returning a value. Write a program that return the sum of the numbers and print the result outside of function.	**Apply**	**6**
B)	Write a Python program to make a simple calculator using function.	**Create**	**6**
C)	Explain following data structure in detail with example (a) List, (b) Tuple and (c) Dictionary	**Analyze**	**6**
Q.4	**Solve Any Two of the following.**		**12**
A)	Explain with example: (a) break, (b) continue and (c) pass statement in Python.	**Analyze**	**6**
B)	What do you mean by scope of a variable? What are its types? Give example of each type.	**Analyze**	**6**

C)	Given a point (x, y), write a Python program to find out if it lies on the x-axis, y-axis or at the origin	Apply	6

Q. 5 Solve Any Two of the following. **12**

A)	What are different control statements used in python? Explain each.	Analyze	6
B)	Write a program to demonstrate use of class for the following: Create a class named Person, use the __init__() function to assign values for name and age, and insert a function that prints name and age of the person, and execute it on the p1 object.	Apply	6
C)	Explain how to draw basic shapes, such as lines, squares, circles, and triangles, using Turtle Graphics in Python.	Understand	6

***** End *****

TY 1+C

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Summer Examination 2023

Course B. Tech. **Branch :** Electronics and Tele-communication Engineering/ Electronics and Communication Engineering **Semester** VI

Subject Code & Name: BTETC601 Antenna Wave Propagation

Max Marks: 60 **Date: 13.07.2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	State Poynting theorem	(L1)	6
B)	Derive the FRIIS Transmission Equation	(L2)	6
C)	Explain the term Virtual height, MUF and Skip Distance	(L2)	6
Q.2	**Solve Any Two of the following.**		**12**
A)	Find the radiation resistance of a Hertzian dipole of length $\lambda/40$	(L3)	6
B)	Explain the Radiation Pattern.	(L1)	6
C)	Prove that effective area $A_e = \frac{\lambda^2}{4\pi} g_d$	(L3)	6
Q. 3	**Solve Any Two of the following.**		**12**
A)	Explain the 2 element Uniform array and prove that $E = 2E_\lambda \cos\left(\frac{\pi d \cos\phi}{\lambda} + \frac{\alpha_e}{2}\right)$	(L1)	6
B)	Explain the Term Pattern Multiplication	(L2)	6
C)	Explain the Log Periodic Antenna	(L3)	6
Q.4	**Solve Any Two of the following.**		**12**
A)	Explain the drawbacks of smart antenna	(L2)	6
B)	Explain Cellular Radio System	(L1)	6
C)	Explain Antenna Beam forming	(L2)	6

Q. 5	**Solve Any Two of the following.**		**12**
A)	Explain the Rhombic Antenna Design	(L1)	6
B)	Explain V and Inverted V Antenna	(L3)	6
C)	Explain Microstrip Antenna	(L2)	6

***** End *****

TY. ETC.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer Examination – 2023

Course: B. Tech. **Branch : Electronics & Telecommunication Engineering** **Semester : VI**

Subject Code & Name: BTETC601 - Antennas and Wave Propagation

Max Marks: 60 **Date: 11/07/2023**

Duration: 3 Hr.

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve/ Answer Any Two of the following.**		**12**
A)	Derive an expression for Helmholtz's equation for the wave propagating in lossy dielectric.	01	**6**
B)	State Poynting's theorem. Also derive an expression for Poynting's theorem.	01	**6**
C)	A uniform plane wave propagating in a good conductor has $\mathbf{E} = e^{-\alpha z} \sin(10^8 t - \beta z)\mathbf{a}_y$ V/m If the medium is characterized by $\varepsilon_r = 1$. $\mu_r = 20$ and $\sigma = 4$ S/m, find α, β, and **H.**	01	**6**
Q.2	**Solve/ Answer Any Two of the following.**		**12**
A)	Explain in brief: a) Ground wave propagation, b) Space wave propagation, c) Sky wave propagation.	03	**6**
B)	Explain structure of atmosphere in brief.	03	**6**
C)	Calculate critical frequencies for F1, F2, and E-Layer for which the maximum ionic densities are 2.5×10^6 cm-3, 4×10^6 cm^{-3} and 2×10^6 cm^{-3} respectively.	03	**6**
Q. 3	**Solve/ Answer Any Two of the following.**		**12**
A)	Explain radiation mechanism for a) single wire antenna and b) two wire antenna.	02	**6**
B)	Define: a) radiation pattern, b) radiation power density, c) directivity and d) gain.	02	**6**
C)	Determine the radiation resistance of an antenna if it has a loss resistance of 20Ω, power gain of 50 and directivity of a) 70 and b) 60.	02	**6**
Q.4	**Solve/ Answer Any Two of the following.**		**12**
A)	Find E and H fields for Hertzian dipole antenna with uniform current distribution.	02	**6**
B)	What are dipole arrays? Explain a) Broadside array and b) Endfire array.	02,03	**6**
C)	Write a short note on Yagi – Uda antenna.	03	**6**
Q. 5	**Solve/ Answer Any Two of the following.**		**12**
A)	Explain travelling wave Antennas in detail.	03	**6**
B)	Explain in detail : Microstrip Antenna	03	**6**
C)	Explain Cassegrain feed parabolic reflector with suitable diagram.	03	**6**

*** End ***