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ASHOKRAO MANE GROUP OF INSTITUTIONS

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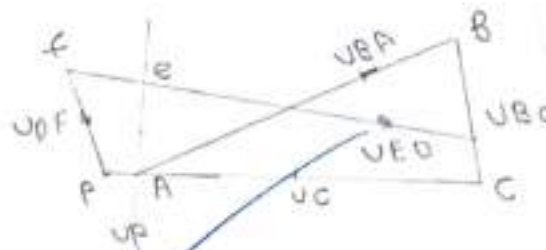
QUESTION PAPER: (BE/ME/MBA)

Class: SY

Dept: civil

Exam date: August 2022
7 / 20

Paper Quantity: 7



Velocity Diagram

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. (S.Y.)

Branch : CIVIL

Semester :IV

Subject Code & Name: BTCVC405 HYDRAULICS II

Max Marks: 60

Date: 27/08/2022

Duration: 3.45 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 (C) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(CO)	Marks
Q.1 Solve Any Two of the following.		
A) Define open channel flow and differentiate pipe flow from channel flow	(1)	6
B) Derive an expression for discharge through triangular notch	(1)	6
C) Find the time required to lower down water level from 3 m to 2 m in a reservoir of 80 m x 80 m by i) a rectangular notch of length 1.5 m ii) a right angled V notch. Take $C_d = 0.62$ & other data same for both.	(1)	6
Q.2 Solve Any Two of the following.		
A) Derive an expression for most efficient trapezoidal section of a channel.	(1)	6
B) Explain with neat diagram :- specific energy curve	(1)	6
C) The discharge of water through a rectangular channel of width 8 m, discharge 15 m ³ /s when depth of flow of water is 1.2 m. Calculate :- i) specific energy ii) critical depth iii) minimum specific energy	(1)	6
Q.3 Solve Any Two of the following.		
A) Derive the dynamic equation gradually varied flow.	(2)	6
B) A sluice gate discharges water into a horizontal rectangular channel with a discharge 19.20 m ³ /s, width of channel 8 m and depth of flow 0.40 m. Determine whether a jump will occur, if so find its height & loss of energy Per kg of water.	(2)	6
C) A jet of diameter 7.5 cm strikes a curved plate at its centre with a velocity 20 m/s. The curved plate is also moving with a velocity of 8 m/s in the direction of jet. The jet is deflected through an angle of 165° assuming the plate smooth find:- i) force exerted by jet ii) work done by the jet.	(3)	6
Q.4 Solve Any Two of the following.		
A) Classify different types of turbines. Also differentiate impulse and reaction turbine.	(3)	6
B) Describe draft tube stating its need and performance, also state different shapes of it.	(3)	6

A pelton wheel turbine has mean bucket speed of 10 m/s with a jet of water flowing at a rate of 700 lit/s under a head of 30 m. The bucket deflects the jet through an angle of 160° . Calculate horse power and hydraulic efficiency of turbine, assuming co-efficient of velocity 0.98.

(3) 6

5 Solve Any Two of the following.

a) How pumps are generally classified, Explain in detail working of a centrifugal pump.

(3) 6

B) Write a detailed note on :—
i) Efficiencies of pump.

ii) Multistage pump arrangements.

(3) 6

C) A centrifugal pump delivers water against a net head of 14.5 m and at a speed of 1000 r.p.m. The vanes are curved at an angle of 30° with the periphery. The impeller diameter is 300 mm and the outlet width 50 mm. Determine the discharge of pump if manometric efficiency is 95%.

(3) 6

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch: Civil Engineering

Semester: IV

Subject Code & Name: BTCVC402, Environmental Engineering

Max Marks: 60

Date: 18/08/2022

Duration: 3.45 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) The population of a town for the past census data is given below Estimate population after 3 decades by arithmetic increase method.

CO1 6

Year	1970	1980	1990	2000
Population in thousands	50	58	67	89

- B) Explain factors affecting rate of water demand.

CO1 (5) 6

- C) Which are the various types of demands to be considered to determine water demand for any city?

CO1 6

Q.2 Solve Any Two of the following.

- A) What are the objectives of aeration process? Explain 'Cascade aerator'.

CO2 6

- B) Design a sedimentation tank to treat a flow of 5MLD.

CO2 6

- C) Compare Slow sand filter and Rapid sand filter.

CO2 6

Q.3 Solve Any Two of the following. (This is just a sample instruction)

- A) Explain dead end system of water distribution with its advantages and Disadvantages.

CO3 6

- B) Find length of an equivalent pipe for the pipe network system given below if equivalent diameter is 300 mm. Use Darcy's formula.

CO3 6

Pipe	Length (m)	Diameter (mm)
AB	270	300
BC	390	400
CD	510	200

- C) Explain with diagram combined, gravity and pumping system for supply of water with its advantages and disadvantages.

CO3 6

Q.4 Solve Any Two of the following.

- | | | |
|--|-----|---|
| A) Draw wastewater treatment flow sheet and explain the functions of each component | CO3 | 6 |
| B) Determine Ultimate BOD for a sewage having 5 day BOD at 20°C as 200 mg/lit. Assume de-oxygenation constant as 0.12 per day. | CO4 | 6 |
| C) Enlist various methods used for treatment of solid waste. Explain any one treatment method in detail. | CO4 | 6 |

Q. 5 Solve Any Two of the following.

- | | | |
|--|------------|---|
| A) What is Air Pollution? What are the sources of air pollution? | Remember | 6 |
| | Understand | |
| B) Explain how atmospheric stability changes based on relation between adiabatic lapse rate (ALR) and environmental lapse rate (ELR). | Remember | 6 |
| | Understand | |
| C) Enlist various equipment's used for controlling air pollution. Explain with neat diagram any one air pollution controlling equipment. | Remember | 6 |
| | Understand | |

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch : Civil Engineering

Semester : IV

Subject Code & Name: BTCVC404 Water Resources Engineering

Max Marks: 60

Date: 24/08/2022

Duration: 3.45 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.

Q.1 Solve Any Two of the following.

A) Explain the different methods of distribution of water.

(Level/CO) Marks

COI Understand 6

B) After how many days will you supply water to soil in order to ensure sufficient irrigation of the given crop, if

- (i) Field capacity of the soil = 28%
- (ii) Permanent wilting point = 13%
- (iii) Dry density of soil = 1.3 gm/cc
- (iv) Effective depth of root zone = 70 cm
- (v) Daily consumptive use of water for the given crop = 12 mm

COI Apply 6

Assume any other data not given.

C) The gross command area for a distributary is 6000 hectares, 80% of which is culturable irrigable. The intensity of irrigation for Rabi season is 50% and that for Kharif season is 25%. If the average duty at the head of the distributary is 2000 hectares/cumec for Rabi season and 900 hectares/cumec for Kharif season, find out the discharge required at the head of the distributary from average demand considerations.

COI Apply 6

Q.2 Solve Any Two of the following.

A) What are the different Zones of storage/ control levels in a reservoir? Explain with the help of a diagram.

CO2 Understand 6

B) Analyse the following failures in Gravity dam:-

- a) By overturning (or rotation) about the toe
- b) By crushing (or compression)

CO2 Analyze 6

C) A proposed reservoir has capacity of 500 ha-m. The catchment area is 125 km², and the annual stream flow averages 12 cm of runoff. If the annual sediment production is 0.03 ha.m/km², what is the probable life of the reservoir before its capacity is reduced by 10% of its initial capacity by sedimentation? The relationship between trap efficiency η (%)

CO2 Apply 6

C/I	0.01	0.02	0.04	0.06	0.08	0.1	0.2	0.3	0.5	0.7
η (%)	43	60	74	80	84	87	93	95	96	97

Q.3 Solve Any Two of the following.

A) Explain the components of earthen dam and their functions with the help of a diagram.

CO2 Understand 6

B) Write a short note on following failures in earthen dam:-

- a. Hydraulic Failure
- b. Seepage Failure
- c. Structural Failure

CO3 Understand 6

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- C) What are the assumptions and limitations regarding Kennedy's silt theory?

CO3
Understand 6

Q.4 Solve Any Two of the following.

- A) A catchment has 6 raingauge stations. In a year, the annual rainfall recorded by the gauges are as follows:

Station	A	B	C	D	E	F
Rainfall (cm)	82.6	102.9	180.3	110.3	98.8	136.7

CO3
Apply 6

For a 10% error in the estimation of mean rainfall, calculate the optimum numbers of stations in the catchment.

- B) The ordinates of 3hr UH of a catchment are given below

Time (hr)	0	3	6	9	12	15	18	21
3 hr UHO (m ³ /s)	0	10	20	16	12	8	4	0

CO3
Apply 6

Derive flood hydrograph at the catchment outlet due to a storm given below. Assume Φ index is 3 mm/hr and constant base flow 10 m³/s.

Time (hr) for start of storm	0	3	6	9
Accumulated rainfall (cm)	0	3.9	4.7	7.6

- C) Explain the following methods to analyze rainfall record data with the help of diagram:

- a. Mass Curve of rainfall
b. Hyetograph

CO3
Understand 6

Q.5 Solve Any Two of the following.

- A) Explain groundwater movement using Darcy's law.
B) Explain Bligh's Creep Theory and its limitations.
C) What are the causes and ill-effects of water logging?

CO3
Understand 6

CO3
Understand 6

Understand 6

*** End ***

Instructions to the Students:

1. All the questions are compulsory.
2. Figures to right indicates full marks.
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) State and Explain Moment area theorem's.

Knowledge 6

B) Find the deflection at free end of cantilever beam shown in fig 1. If cross section of beam is 100 mm wide and 200 mm deep. Take $E = 11 \text{ Gpa}$

Analysis 6

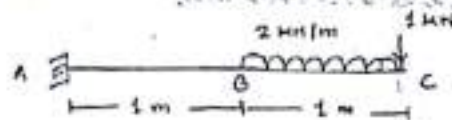


Fig (1)

C) Compute the max deflection of beam shown in fig 2. Take $E = 2 \times 10^5 \text{ Mpa}$ and $I = 3 \times 10^7 \text{ mm}^4$. Use conjugate beam method.

Application 6

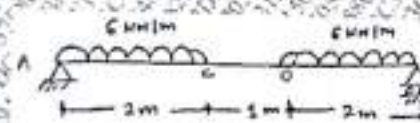


Fig (2)

Q.2 Solve Any Two of the following.

A) Derive the expression for strain energy due to traction.

Understand 6

B) Determine the deflection at point C and B. of fig 3

Application 6



Fig (3)

C) A simply supported beam AB of span 8 m carries udl of 20 kN/m over the right hand of beam using castigliano's first theorem calculate deflection at mid span $EI = 32000 \text{ Kn-m}^2$

Analysis 6

Q.3 Solve Any Two of the following.

A) Explain Castigliano's first theorem.

Remember 6

B) A fixed beam AB of span 15 m two couples 20 KN-m and 30 KN-m are acting at 5m and 7.5 from left side respectively. Find the fixed end moments.

C) Explain the procedure for analysis of indeterminate beams.

Q.4 Solve Any Two of the following.

A) Define Stiffness, relative stiffness, carry over factor, and distribution factor

B) Analyze the beam as shown in fig.4 by moment distribution method.

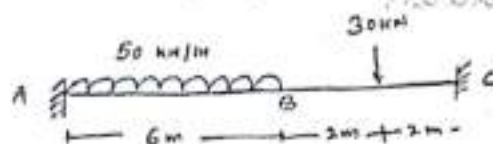


Fig (4)

C) Draw SFD and BMD of frame as shown in fig 5 if $M_a = 3.43$ Kn-m and $M_b = 6.86$ Kn-m clockwise at beam AB.

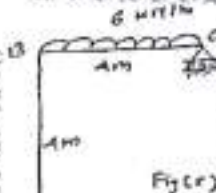


Fig (5)

Q.5 Solve Any Two of the following.

A) Analyze propped cantilever as shown in fig 6 by slope deflection method draw SFD and BMD.

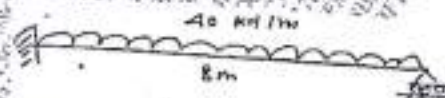


Fig (6)

B) Using slope deflection method, analyze the frame as shown in fig 7 draw SFD and BMD.

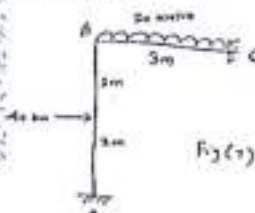


Fig (7)

C) Explain the procedure for analysis of continuous beam with sinking of supports by slope deflection method.

End

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Instructions to the Students:

1. All the questions are compulsory.
2. Figures to right indicates full marks.
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) State and Explain Moment area theorem's. Knowledge 6
- B) Find the deflection at free end of cantilever beam shown in fig 1. If cross section of beam is 100 mm wide and 200 mm deep. Take $E = 11 \text{ Gpa}$. Analysis 6

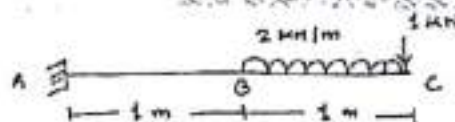


Fig (1)

- C) Compute the max deflection of beam shown in fig 2. Take $E = 2 \times 10^5 \text{ Mpa}$ and $I = 3 \times 10^7 \text{ mm}^4$. Use conjugate beam method. Application 6

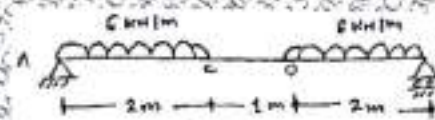


Fig (2)

Q.2 Solve Any Two of the following.

- A) Derive the expression for strain energy due to traction. Understand 6
- B) Determine the deflection at point C and B. of fig 3. Application 6

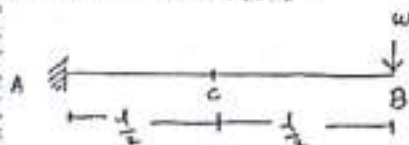


Fig (3)

- C) A simply supported beam AB of span 8 m carries udl of 20 KN/m over the right hand of beam using castigliano's first theorem calculate deflection at mid span $EI = 32000 \text{ Kn-m}^2$. Analysis 6

Q.3 Solve Any Two of the following.

- A) Explain Castigliano's first theorem. Remember 6



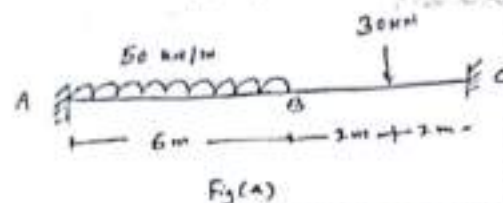
- B) A fixed beam AB of span 15 m two couples 20 KN-m and 30 KN-m are acting at 5m and 7.5 from left side respectively. Find the fixed end moments. Analysis 6

- C) Explain the procedure for analysis of indeterminate beams. Knowledge 6

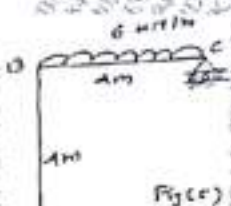
Q.4 Solve Any Two of the following.

- A) Define Stiffness, relative stiffness, carry over factor, and distribution factor Remember 6

- B) Analyze the beam as shown in fig.4 by moment distribution method Analysis 6

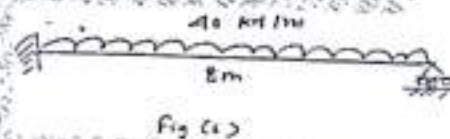


- C) Draw SFD and BMD of frame as shown in fig 5 if $M_a = 3.43$ KN-m and $M_b = 6.86$ KN-m clockwise at beam AB. Analysis 6

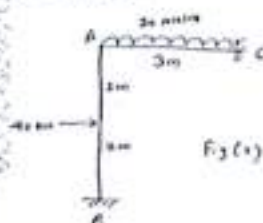


Q.5 Solve Any Two of the following.

- A) Analyze propped cantilever as shown in fig 6 by slope deflection method draw SFD and BMD. Analysis 6



- B) Using slope deflection method, analyze the frame as shown in fig 7 draw SFD and BMD. Analysis 6



- C) Explain the procedure for analysis of continuous beam with sinking of supports by slope deflection method. Synthesis 6

End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch : Civil Engineering

Semester : IV

Subject Code & Name: BTCVC401 Building Planning & Drawing

Max Marks: 60

Date: 12/08/2022

Duration: 5 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/CO) Marks

Q.1 Solve Any Two of the following.

- A) Explain various principles of Building Planning. (CO1) 6
- B) Discuss the criterion affecting building planning under Indian conditions. (CO1) 6

OR

- A) Draw detailed plan and elevation of residential house. (CO1) 12

Q.2 Solve Any Two of the following.

- A) Explain concept of anthropometry in detail. (CO1) 6
- B) Draw site plan of a row house project. (CO1) 6
- C) Discuss the process of obtaining occupancy certificate. (CO1) 6

Q.3 Solve Any Two of the following.

- A) Draw drainage plan of a residential building. (CO2) 6
- B) Draw sectional plan for residential building showing plumbing fixtures and components. (CO2) 6
- C) Discuss Rain water harvesting system in detail. (CO2) 6

Q.4 Solve Any Two of the following.

- A) Discuss ventilation system and selection criteria. (CO2) 6
- B) Explain principles of air conditioning. (CO2) 6
- C) Discuss methods of Thermal Insulation in buildings. (CO2) 6

Q.5 Solve Any Two of the following.

- A) Discuss various methods of noise prevention. (CO3) 6
- B) Explain the phenomenon of reverberation and its significance in acoustics. (CO3) 6
- C) Discuss various applications of Green Building. (CO3) 6

***** End *****



DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

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

Subject Code & Name: BTCVC406 Engineering Geology

Max Marks: 60

Date: 30/08/2022

Duration: 3.45 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) Give applications of Geology in Civil Engineering	CO1	6
B) Name four physical features of earth and explain any one.	CO1	6
C) Explain geological work of river w.r.t erosion.	CO1	6
Q.2 Solve Any Two of the following.		
A) Name four properties of Mineral and explain lustre in short.	CO2	6
B) Define Sedimentary rocks and metamorphic rocks.	CO2	6
C) Define Igneous Rock & its classification on any one basis.	CO2	6
Q.3 Solve Any Two of the following.		
A) Explain the terms Outcrop, Strike and Dip.	CO3	6
B) Define Fold. Describe Anticline & Syncline Fold?	CO3	6
C) Give the six main requirements of good Building Stone?	CO3	6
Q.4 Solve Any Two of the following.		
A) Explain Preliminary geological survey in detail.	CO4	6
B) Give various favorable and unfavorable geological conditions for reservoir site	CO4	6
C) Give six Site improvement techniques for structures as reservoir.	CO4	6
Q.5 Solve Any Two of the following.		
A) Give Limitations of exploratory drilling method.	CO4	6
B) Explain terms core loss and core recovery.	CO4	6
C) Write a short note on preservation of cores.	CO4	6

*** End ***

DR. BARASAHER AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch: Multiple Branches Semester : IV

Subject Code & Name: (BT1HM403) Basic Human Rights

Max Marks: 60

Date: 20/08/2022

Duration: 3.45 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 One of the following		
A) Write short notes on:	L2/CO2	12
i) Liberty		
ii) Equality		
iii) Fraternity		
B) Write short notes on:	L2/CO2	12
i) Civil society		
ii) State		
iii) Industrialism and the present social system		
Q.2 Solve any Two of the following		
A) What is the contribution of the French Revolution to the human rights movement?	L3/CO1	6
B) Explain the following concepts:	L3/CO1	6
i) Interrelationship between religion and culture		
ii) Communal riots and social harmony		
C) Elaborate the following terms:	L3/CO1	6
i) Unemployment		
ii) Rural poverty		
Q.3 Solve any Two of the following		
A) Throw light on the rights of migrant workers.	L5/CO5	6
B) How will you focus on the rights of mentally and physically challenged people? Elaborate.	L5/CO5	6
C) 'Freedom is the soul of democracy'. Justify.	L5/CO5	6
Q.4 Solve the following		
A) Elaborate the contribution of NGOs in India to help people get their rights in regard with:	L4/CO4	12
a) Water		
b) Forest		
c) Land		
Q.5 Solve any Two of the following		
A) Illustrate the fundamental rights in the Constitution of India?	L2/CO3	6
B) What duties are suggested by the Constitution of India? Explain.	L2/CO3	6
C) What is UDHR; what are its provisions in India?	L2/CO3	6

*** End ***

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Shri Balasaheb Mane Shikshan Prasarak Mandal, Ambap's
ASHOKRAO MANE GROUP OF INSTITUTIONS

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QUESTION PAPER: (BE/ME/MBA)

Class: SY

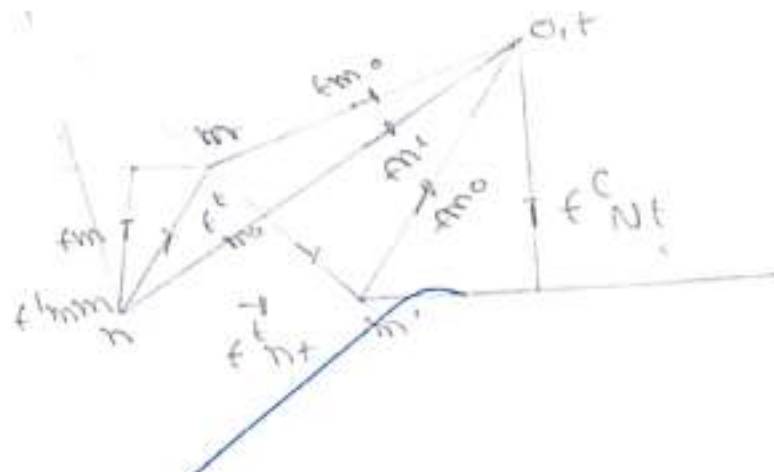
Dept: Computer

Exam date: August - 2022
/ / 20

Paper Quantity: 5



velocity diagram



DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Branch : Computer Engineering/ CSE/ CSE(AI&ML)

Course: S.Y B. Tech.

Semester :IV

Subject Code & Name: BTCOC401 (Design and Analysis of Algorithm)

Max Marks: 60

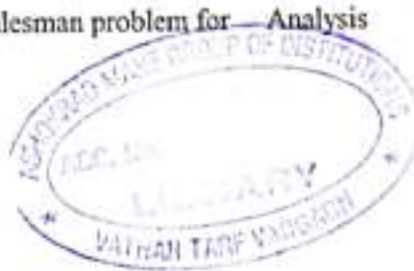
Date: 12/08/2022

Duration: 3.45 Hr.

Instructions to the Students:

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4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Marks
Q.1 Solve Any Two of the following		
A) Define Algorithm? State the main characteristics of Algorithm	Knowledge	6
B) Describe Asymptotic notations with expression	Understand	6
C) Evaluate $9T(n/3) + n$	Evaluation	6
Q.2 Solve Any Two of the following.		
A) Describe an algorithm for Merge Sort and find its time complexity	Understand	6
B) Evaluate and write the algorithm for Quick sort describe its best and worst case with suitable example	Evaluation	6
C) $\begin{bmatrix} 6 & 7 \\ 5 & 4 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ Solve using Strassen's Matrix Multiplication, and Calculate its time complexity	Analysis	6
Q.3 Solve Any Two of the following.		
A) Draw a state space tree for finding four queens solutions	Understand	6
B) Apply branch and bound technique to solve travelling salesman problem for	Analysis	6
$ \begin{matrix} & \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 & \\ 3 & 5 & \infty & 2 & 4 & \\ 19 & 6 & 18 & \infty & 3 & \\ 16 & 4 & 7 & 16 & \infty & \end{matrix} $ the graph whose matrix is		
C) Describe Graph Coloring Problem with suitable example	Understand	6
Q.4 Solve Any Two of the following.		
A) Solve the Fractional Knapsack problem Given $n = 5$ objects and a knapsack capacity $W = 60$ profit = (30, 20, 100, 90, 160) Weight = (5, 10, 20, 30, 40)	Analysis	6
B) Solve an optimal Huffman code for the following set of frequencies a: 50 b: 25 c: 15 d: 40 e: 75	Analysis	6
C) Solve Job sequencing with deadlines $n=4$, $p=(100,10,15,27)$ and $d=(2,1,2,1)$ find optimal solution	Analysis	6



Q. 5 Solve Any Two of the following.

A) Calculate the shortest path by using Floyd's Warshall Algorithm

0	4	5
2	0	∞
∞	-3	0

B) Calculate the longest common subsequence for $X = \{A, B, C, B, D, A, B\}$

$Y = \{B, D, C, A, B, A\}$

C) Differentiate between Dynamic Programming and greedy Approach

*** End ***

Application

Application

Analysis

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch : COMPUTER ENGG/CSE

Semester :IV

Subject Code & Name: BTES405 Digital Logic Design & Microprocessor

Max Marks: 60

Date: 27/08/2022

Duration: 3.45 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 Signal? Write Characteristics of Digital Signals.	Analyzing	
B)	Explain Digital Gate with their types.	Understanding	
C)	Write short note on Error Detecting and Correcting Codes.	Applying	
Q.2	Solve Any Two of the following.		12
A)	Explain the working of Multiplexer and De-Multiplexer.	Understanding	
B)	Write and explain with example Don't care conditions.	Applying	
C)	Minimize the four-variable logic function using k-map. $f(A,B,C,D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 11, 14)$	Applying	
Q.3	Solve Any Two of the following.		12
A)	Design 3-bit synchronous up counter using JK flip flops	Applying	
B)	Convert S-R FLIP-FLOP TO J-K FLIP-FLOP.	Applying	
C)	Write and explain any two applications of flip-flop.	Understanding	
Q.4	Solve Any Two of the following.		12
A)	Comparison of 8-bit, (8085) 16-bit (8086), and 32-bit microprocessors (80386)	Understanding	
B)	Draw and explain 8086 Internal Block Diagram.	Understanding	
C)	Write short note on Memory.	Understanding	
Q.5	Solve Any Two of the following.		12
A)	Explain different type of Addressing modes of 8086.	Analyzing	
B)	Write different Data transfer instructions.	Analyzing	
C)	Write short note on Assemblers and compilers	Understanding	

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch: Computer Engineering Semester: IV

Subject Code & Name: BTCOC402 & Operating Systems

Max Marks: 60

Date: 18/08/2022

Duration: 3.45 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)	Marks
Q.1 Solve Any Two of the following. (This is just a sample instruction)		
A) Define a virtual machine with neat diagram. Describe the concept and working of JVM. Explain what are the benefits of a VM?	(2)	6
B) What is the purpose of command interpreter? Why is it usually separate from the Kernel?	(2)	6
C) Describe major activities of an operating system in regard to: 1) Process management 2) File management 3) Main Memory management 4) Secondary storage management	(2)	6

Q.2 Solve Any Two of the following. (This is just a sample instruction)

- A) Consider the following data with burst time given in milliseconds: (3) 6

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The process has arrived in the order P1, P2, P3, P4, P5.

- i) Draw Gantt charts for the execution of these processes using FCFS, SJF, non-preemptive Priority and RR (quantum=2) scheduling.
- ii) What is turnaround time and waiting time of each process for each of the scheduling algorithm.

B) What are co-operating processes? Describe the mechanism of inter process communication using shared memory and message passing	(2)	6
C) Suppose the following jobs arrive for processing at the times indicated, each job will run the listed amount of time.	(3)	6



Job	arrival time	burst time
1	0.0	8
2	0.4	4
3	1.0	1

- Give a Gantt chart illustrating the execution of these jobs using the non-preemptive FCFS and SJF scheduling algorithms.
- What is turnaround time and waiting time of each job for the above algorithms?

Q.3 Solve Any Two of the following. (This is just a sample instruction)

- A) Examine banker's algorithm after applying to the example given below. A system has 5 processes, P1, P2, P3, P4 and P5. There are 3 types of resources R1, R2 and R3. there are 10 instances of R1, 5 instances of R2 and 7 instances of R3. At time T0, the situation is as follows: (3) 6

Process	Allocation			Maximum		
	R1	R2	R3	R1	R2	R3

P1 0 1 0

P2 2 0 0

P3 3 0 2

P4 2 1 1

P5 0 0 2

7 5 3

3 2 2

9 0 2

2 2 2

4 3 3

Is the system in a safe state at time T0?

Suppose now at time T1, process P2 requests one additional instance of resource type R1, is the system in a safe state?

- B) Why is deadlock state more critical than starvation? Describe resource allocation graph with a deadlock, also explain resource allocation graph with a cycle but no deadlock. (2) 6
- C) Describe the bounded-buffer-Producer-Consumer problem and give a solution for the same using semaphores. Write the structure of Producer and Consumer processes. (2) 6

Q.4 Solve Any Two of the following. (This is just a sample instruction)

- A) Given memory partitions of 150 K, 250 K, 500 K, 300 K and 600 K (in order) how would each of the first-fit, best-fit and worst-fit algorithms allocate processes of 212K, 417K, 112K and 426 K (in order)? Which algorithm makes the most efficient use of memory? (3) 6

- B) Consider the following page reference string (3) 6
1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6

Find out the number of page faults if there are 3 page frames, using the following page replacement algorithm i) LRU ii) FIFO iii) Optimal

- C) Describe the action taken by the operating system when a page fault occurs with neat diagram. (2) 6

Q. 5 Solve Any Two of the following. (This is just a sample instruction)

- A) Describe the different file allocation methods. Also explain the methods of file implementation with merits and demerits. (2) 6

- B) Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. the drive currently services a request at cylinder 1043, and the previous request was at cylinder 1225. the queue of pending request in FIFO order is 486, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Starting from the current position, what is the total distance (in cylinders) that the disk arm moves to satisfy all pending requests, for each of the following algorithms i) FCFS ii) SSTF iii) SCAN iv) LOOK v) C-SCAN. (3) 6

- C) Describe how free-space management is implemented in file system. Also explain bit map with the help of an example (2) 6

*** End ***



**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE-RAIGAD-402103**

Summer Semester Examination, 2022

B.Tech. Computer Engineering /CSE/ CSE(AI&ML).

Semester: IV Max. Marks: 60

**Subject: Probability Theory & Random Processes/Probability
and Statistics [BTBS404]**

Date: 24/08/2022

Time: 3.45 Hrs

Instructions to the Student:

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 pare or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

Marks

Que: 1 Attempt any TWO of the following questions.

[12]

A) i) What is the chance that a non-leap year should have fifty three Sundays?

ii) Urn A contains 5 red and 3 white memory chips; the urn B contains 2 red and 6 white memory chips. If a chip is drawn from each box what is the probability that they are both of the same colour?

B) A committee of 4 persons is to be appointed from 3 officers of the production department, 4 officers of the purchase department, 2 officers of the sales department and 1 chartered accountant. Find the probability of the committee in the following manner:

- i) There must be one from each category.
- ii) It should have at least one from the purchase department.
- iii) The chartered accountant must be in the committee

C) In a certain college 25% of boys and 10% of girls are studying mathematics. The girls constitute 60% of the students. If a student is selected at random and is found to be studying mathematics, find the probability that the student is a (i) girl and (ii) a boy.

Que: 2 Attempt any TWO of the following questions.

[12]

A) i) A continuous random variable has the probability density function $f(x)f(x)$ as



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$$f(x) = \begin{cases} ke^{-x}, & x > 0 \\ 0, & \text{elsewhere} \end{cases}$$

Determine the constant k .

ii) Obtain the probability distribution of X , the number of heads in three tosses of a coin. Also find the expected number of heads appearing when a fair coin is tossed three times.

B) Fit a Binomial distribution to the following observation:

x	0	1	2	3	4	5
f	2	14	20	34	22	8

C) Sacks of sugar packed by an atomic loader having an average weight of 100 kg with standard deviation 0.250 kg. Assuming normal distribution find chance of sack get weighing less than 99.5 kg. (Given: $A(2) = 0.4772$)

Que: 3 Attempt the following questions.

[12]

A) From the following data, calculate the rank correlation coefficient by Karl Pearson's method

x	6	2	10	4	8
y	9	11	7	8	7

Arithmetic means of X and Y series are 6 and 8 respectively.

B) From the following table, calculate the coefficient of correlation by Karl Pearson's method

x	48	33	40	9	16	16	65	24	16	57
y	13	13	24	6	15	4	20	9	6	19

Que: 4 Attempt the following questions.

[12]

A) Obtain the least square regression line of y on x for the following data.

x_i	6	2	10	4	8
y_i	9	11	5	8	7

Also, obtain an estimate of y which should correspond on the average to $x = 5$.

B) The equation of two lines are $2x = 8 - 3y$ and $2y = 5 - x$. Find the mean values of x and y . Find the value of correlation coefficient.

Que: 5 Attempt the following questions.

[12]

A) i) A die was thrown 6000 times and a throw of 5 or 6 was obtained 3240 times. On the assumption of random throwing, do the data indicate an unbiased die?

ii) There are 30% and 25% respectively of fair haired people in the two large populations. Is this difference likely to be hidden in samples of 1200 and 900 respectively from the two populations?

B) A full-time Ph.D. students received an average salary of \$12,837 according to U.S. Department of Education. The dean of graduate studies at a large state University feels that Ph.D. students in his state earn more than this. He surveys 44 randomly selected students and finds their average salary is \$14,445 with a standard deviation of \$150. With $\alpha = 0.05$, $\alpha = 0.05$, is the dean correct?



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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch : COMPUTER ENGG/CSE

Semester :IV

Subject Code & Name: BTES405 Digital Logic Design & Microprocessor

Max Marks: 60

Date: 27/08/2022

Duration: 3.45 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 Signal? Write Characteristics of Digital Signals.	Analyzing	
B)	Explain Digital Gate with their types.	Understanding	
C)	Write short note on Error Detecting and Correcting Codes.	Applying	
Q.2	Solve Any Two of the following.		12
A)	Explain the working of Multiplexer and De-Multiplexer.	Understanding	
B)	Write and explain with example Don't care conditions.	Applying	
C)	Minimize the four-variable logic function using k-map. $f(A,B,C,D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 11, 14)$	Applying	
Q. 3	Solve Any Two of the following.		12
A)	Design 3-bit synchronous up counter using JK flip flops	Applying	
B)	Convert S-R FLIP-FLOP TO J-K FLIP-FLOP.	Applying	
C)	Write and explain any two applications of flip-flop.	Understanding	
Q.4	Solve Any Two of the following.		12
A)	Comparison of 8-bit, (8085) 16-bit (8086), and 32-bit microprocessors (80386)	Understanding	
B)	Draw and explain 8086 Internal Block Diagram.	Understanding	
C)	Write short note on Memory .	Understanding	
Q. 5	Solve Any Two of the following.		12
A)	Explain different type of Addressing modes of 8086.	Analyzing	
B)	Write different Data transfer instructions.	Analyzing	
C)	Write short note on Assemblers and compilers	Understanding	

*** End ***

Shri Balasaheb Mane Shikshan Prasarak Mandal, Ambap's
ASHOKRAO MANE GROUP OF INSTITUTIONS

Vathar Tarf Vadgaon-416112 Tal. Hatkanangle, Dist Kolhapur

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DBATU

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

Class: SY Dept: Electrical

Exam date: August - 2022 Paper Quantity: 5



DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Semester Examination – Summer 2022

Course: B. Tech.

Branch : Electrical Engineering

Semester : IV

Subject Code & Name: BTEEPE405D Electronics Devices and Circuits

Max Marks: 60

Date: 27/08/2022

Duration: 3.45 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.

Marks

Q.1 Solve Any Two of the following.

- A) Compare Common Emitter, Common Base, and Common Collector configuration of BJT with reference to following point. 6
- i) Input Impedance ii) Current gain iii) Voltage gain
iv) Phase shift between input and output signal
- B) What is biasing? Why biasing is required for transistor? List biasing methods for transistor. Draw and explain the circuit of voltage divider biasing. 6
- C) Draw the neat-labeled diagram of two-stage RC coupled amplifier with frequency response and explain it in detail. 6

Q.2 Solve Any Two of the following.

- A) Draw & Explain Transfer characteristics of JFET. 6
- B) Define following terms: 6
- a) Dynamic Drain Resistance b) Amplification Factor c) Pinched off voltage
- C) Explain Working Principle of Enhancement type MOSFET (n-channel). 6

**Q.3 Solve Any Two of the following.**

- A) Explain class A power amplifier circuit with output characteristics showing Q point. 6
- B) With neat diagram explain the working of Push-Pull Class B Power Amplifier. 6
- C) What is Cross-over Distortion? How it can be eliminated. 6

Q.4 Solve Any Two of the following.

- A) Sketch the block diagram of a feedback amplifier and derive the expression for gain with positive feedback and with negative feedback. 6
- B) Draw the circuit diagram of voltage series and voltage shunt amplifier and derive an expression for input impedance, output impedance and voltage gain. 6
- C) Draw the circuit of Emitter Follower and derive the expression for voltage gain of Emitter 6

Follower.

Q. 5 Solve Any Two of the following.

- A) State Barkhausen Criterion for oscillations. Explain the principle of operation of oscillator. 6
- B) Discuss the working principle of Wein bridge oscillator and derive the expression for frequency of oscillations. 6
- C) Draw and explain block diagram of shunt regulator also explain zener and transistorized shunt regulator. 6
- D) Explain the pin configuration of IC-555, also state use of each pin. Draw an astable multi-vibrator using IC-555. 6

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech Branch: Electrical Engineering and Allied Branches

Sem: IV

Subject Code & Name: BTEEC401 Network Theory

Max Marks: 60

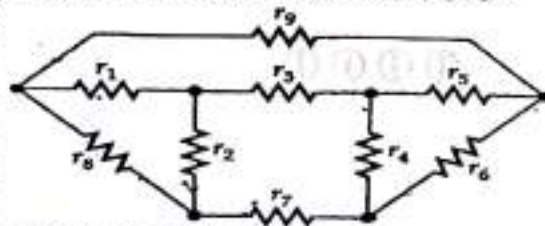
Date:- 12/08/2022

Duration:- 3.45 Hr.

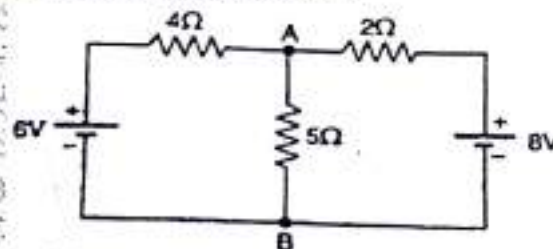
Instructions to the Students:

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 calculator 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 the difference between short circuit (SC) and open circuit (OC) with an example.	Understand	6
B) Explain the following terms with suitable example 1. Linear and non linear elements 2. Unilateral and bilateral elements	Understand	6
C) Explain two types of energy source. Distinguish between ideal and non-ideal sources.	Understand/ Analysis	6
Q.2 Solve Any Two of the following.		
A) State and Explain KVL and KCL with example	Knowledge	6
B) Following figure represents a resistive network. Draw its graph. Select a suitable tree and obtain the tie-set matrix.	Comprehen sion	6



- C). State the Thevenin's theorem and find current through branch AB using Thevenin's theorem. Refer following figure.

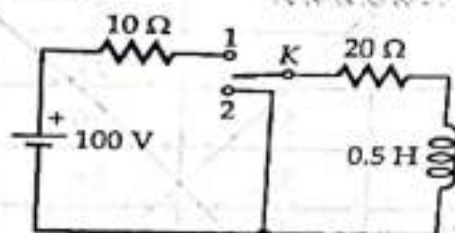


Q.3 Solve Any Two of the following.

A) Explain first order and second order RC and RL circuit.	Understand	6
B) Explain various properties of a capacitor.	Understand	6
C) An inductor with initial current I_0 is connected to a resistor of R ohms at $t = 0$. Derive the expression for the current through inductor and voltage across inductor at any time $t > 0$.	Evaluation	6

Q.4 Solve Any Two of the following.

A) Derive the symmetry and reciprocity condition of z-parameters.	Evaluation	6
B) Explain Z-Parameters in terms of Y-parameter & h-parameters.	Understand	6
C) In following figure the switch K is kept first at position 1 and steady state condition is reached. At $t=0$, the switch is moved to position 2. Find the current in both the cases.	Evaluation	6



Q.5 Solve Any Two of the following.

A) Derive the expression for resonant frequency f_r of a series resonant circuit.	Synthesis	6
B) Derive the expression for Q factor of parallel resonating circuit.	Synthesis	6
C) Design a constant K-LPF with $f_c = 1\text{KHz}$ and $R_o = 600\Omega$ At what frequency α will be 10 Db?	Synthesis	6

To calculate (i) L, C (filter Elements)
(ii) Frequency at which $\alpha = 10\text{dB}$

*** End ***

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) With neat sketches discuss the construction of a 3-phase induction motor.	Understand	6
B) Show by Mathematically and Vectorially that in a three phase machine a rotating magnetic field is produced when supplied with three phase supply.	Apply	6
C) Discuss a brief note on Construction of Synchronous machine.	Understand	6
Q.2 Solve Any Two of the following.		
A) With neat sketches give a brief note on Harmonics in alternator and also give a reduction remedies.	Apply	6
B) Memorize the following winding terminologies		6
i. Single layer and double layer winding		
ii. Full pitch and short pitch winding		
iii. Concentrated and distributed winding		
C) A 3-phase, Star-connected alternator supplies a load of 10MW at pf 0.85 lagging and at 11 KV (terminal voltage). Its resistance is 0.1 ohm per phase and synchronous reactance 0.66 ohm per phase Calculate the line value of emf generated.	Analysis	6
Q.3 Solve Any Two of the following.		
A) What is voltage regulation in alternator? Explain any one method to find voltage regulation in alternator.	Remember	6
i) Synchronous impedance method/ EMF Method		
ii) ZPF Method		
B) State the necessity of parallel operation of alternators. List the conditions for parallel operation.	Understand	6
C) A 3 phase star-connected alternator is rated at 1600 KVA, 13,500 V, The armature resistance and synchronous reactance are 1.5 ohm and 30ohm respectively per phase. Calculate the percentage regulation for a load of 1280 KW at 0.8 leading power factor	Evaluation	6

Q.4 Solve Any Two of the following.

- | | | |
|--|------------|---|
| A) Explain with neat diagram, construction and working of double cage induction motor. | Understand | 6 |
| B) A 4 pole, 3 phase induction motor operates from a supply whose frequency is 50Hz. Calculate
i) the speed at which the magnetic field of the stator is rotating
ii) the speed of the rotor when the slip is 0.04 | Evaluation | 6 |
| C) Explain the tests conducted to draw circle diagram of three phase induction motor. Explain how, max. torque max. power output is obtained from circle diagram | Understand | 6 |

Q.5 Solve Any Two of the following.

- | | | |
|--|------------|---|
| A) Draw the circuit diagram of a capacitor start capacitor run single phase induction motor and explain its working | Understand | 6 |
| B) Illustrate neat sketches and explain why single phase induction motor is not self starting; explain the phenomenon through Double field revolving theory. | Apply | 6 |
| C) Demonstrate the principle of operation and application of Permanent magnet motor. | Apply | 6 |

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: SY B. Tech. Branch : Electrical Engineering & Allied Branches

Subject Code & Name: BTEEC403 & Electrical Machine-II Semester : IV

Max Marks: 60

Date: 22-08-2022

Duration: 3.45 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) With neat sketches discuss the construction of a 3-phase induction motor.	Understand	6
B) Show by Mathematically and Vectorially that in a three phase machine a rotating magnetic field is produced when supplied with three phase supply.	Apply	6
C) Discuss a brief note on Construction of Synchronous machine.	Understand	6
Q.2 Solve Any Two of the following.		
A) With neat sketches give a brief note on Harmonics in alternator and also give a reduction remedies?	Apply	6
B) Memorize the following winding terminologies		6
i. Single layer and double layer winding		
ii. Full pitch and short pitch winding		
iii. Concentrated and distributed winding		
C) A 3-phase, Star-connected alternator supplies a load of 10MW at pf 0.85 lagging and at 11 KV (terminal voltage). Its resistance is 0.1 ohm per phase and synchronous reactance 0.66 ohm per phase Calculate the line value of emf generated.	Analysis	6
Q.3 Solve Any Two of the following.		
A) What is voltage regulation in alternator? Explain any one method to find voltage regulation in alternator.	Remember	6
i) Synchronous impedance method/ EMF Method		
ii) ZPF Method		
B) State the necessity of parallel operation of alternators. List the conditions for parallel operation.	Understand	6
C) A 3 phase star connected alternator is rated at 1600 KVA, 13,500 V, The armature resistance and synchronous reactance are 1.5 ohm and 30ohm respectively per phase. Calculate the percentage regulation for a load of 1280 KW at 0.8 leading power factor	Evaluation	6

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Q.4 Solve Any Two of the following.

- | | | |
|--|------------|---|
| A) Explain with neat diagram, construction and working of double cage induction motor. | Understand | 6 |
| B) A 4 pole, 3 phase induction motor operates from a supply whose frequency is 50Hz. Calculate
i) the speed at which the magnetic field of the stator is rotating
ii) the speed of the rotor when the slip is 0.04 | Evaluation | 6 |
| C) Explain the tests conducted to draw circle diagram of three phase induction motor. Explain how, max. torque max. power output is obtained from circle diagram | Understand | 6 |

Q.5 Solve Any Two of the following.

- | | | |
|--|------------|---|
| A) Draw the circuit diagram of a capacitor start capacitor run single phase induction motor and explain its working. | Understand | 6 |
| B) Illustrate neat sketches and explain why single phase induction motor is not self starting; explain the phenomenon through Double field revolving theory. | Apply | 6 |
| C) Demonstrate the principle of operation and application of Permanent magnet motor. | Apply | 6 |

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch : Electrical Engineering Semester : IV

Subject Code & Name: BTBS404 Analog and Digital Electronics

Max Marks: 60 Date: 23/08/2022 Duration: 3.45 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.		2 x 6
A) In a Common Emitter configuration of transistor amplifier if $V_{cc} = 12\text{ V}$, $R_c = 3\text{ K-ohm}$, determine the cutoff point and saturation point, and draw the DC load line.	(L3/CO1)	
B) What do you mean by frequency response curve? Draw the nature of curve and define upper and lower corner frequencies.	(L3/CO1)	
C) With the help of suitable diagram illustrate cascading of an amplifier. Also derive the gain relation for final stage.	(L3/CO1)	
Q.2 Solve Any Two of the following.		2 x 6
A) Illustrate the working of operational amplifier with the help of block diagram. Explain each stage in brief.	(L3/CO2)	
B) An inverting amplifier operating on $\pm 9\text{ V}$, resistance connected to the inverting terminal (R_1) = 2.7 K-ohm , resistance connected in the feedback path (R_0) = 10 K-ohm . If the input signal applied is having amplitude of 4 V , sketch the input and output waveforms.	(L3/CO2)	
C) Illustrate the working of regenerative comparator using operational amplifier with suitable circuit diagram, also sketch the input and output waveforms.	(L3/CO2)	
Q.3 Solve Any Two of the following.		2 x 6
A) Justify, that NAND and NOR gates are known as the universal gates. Implement NAND gate using NOR gate and NOR gate using NAND gates.	(L3/CO3)	
B) Use 1's complement method to solve the following $(1010)_2 - (0110)_2$ and $(52)_{10} - (32)_{10}$	(L3/CO3)	
C) If Hamming code sequence is transmitted and due to error in one position, received code as 1110110, locate the position of the error bit using parity checks and give the method for obtaining the correct sequence.	(L3/CO3)	
Q.4 Solve Any Two of the following.		2 x 6
A) Illustrate in brief working of TTL NAND gate	(L3/CO4)	
B) With the help of neat diagram, explain working of CMOS 2-input-NOR gate. Tabulate all the voltage levels for each case.	(L3/CO4)	
C) Design 3-bit ripple binary counter using J-K flip-flop.	(L3/CO4)	

Q. 5 Solve Any Two of the following.

2 x 6

- A) Simplify the following function using K-Map (L3/CO5)
 $F(A,B,C,D) = \sum m(3,9,11,12,13,14,15) + \sum d(1,4,6)$
- B) Illustrate working of 4 bit Ripple Carry Adder. Give description of intermediate carry stage. What is the disadvantage of the circuit? (L3/CO5)
- C) Implement following function using 4:1 multiplexer. (L3/CO5)
 $F(X,Y,Z) = X'Y'Z + X'YZ' + XYZ' + XYZ$

*** End ***

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QUESTION PAPER: (BE/ME/MBA)

Class: SY

Dept: Electronics

Exam date: August 2022
/ / 20 Paper Quantity: 5



Velocity Diagram.

$$\frac{100}{100} = \frac{100}{100}$$

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch : E&TC

Semester : IV

Subject Code & Name: BTETPE405E Python Programming

Max Marks: 60

Date: 27/08/2022

Duration: 3.45 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) State and explain any six features of python.	CO1	6
B) Explain input and print command in python with suitable example.	CO1	6
C) What will be the output of following print statements?	CO2	6
I. <code>print('GoodLuck' * 2)</code>		
II. <code>print(3-4j + 2+6j)</code>		
III. <code>print('3+4j'*int(4/2))</code>		
Q.2 Solve Any Two of the following.		
A) Explain following operators of python with suitable examples of each.	CO1	6
I. is		
II. in		
III. not in		
B) Explain while loop with suitable example?	CO1	6
C) The distance between two cities (in km.) is input through the keyboard. Write a python program to convert and print this distance in meters and centimeters.	CO2	6
Q.3 Solve Any Two of the following.		
A) Explain break, continue and pass statement with suitable example of each.	CO1	6
B) Explain append() and copy() methods of list with suitable examples of each.	CO1	6
C) The length & breadth of a rectangle are input through the keyboard. Write a python program to calculate and print the area & perimeter of the rectangle.	CO2	6

Q.4 Solve Any Two of the following.

- A) Explain "and, or, not" operators of python with suitable examples of each.

CO1

- B) Write a python program to print following pattern (using while loop).

CO3

```
aaaaaaa
```

```
aaaaa
```

```
aaa
```

```
a
```

- C) What are tuples? With suitable example explain how to add elements to a Tuple.

CO1

Q.5 Solve Any Two of the following.

- A) What are functions in python? Explain recursion with suitable example.

CO1

- B) What is package? What is Python PIP? With example explain how to get list of all packages installed on your system?

CO2

- C) What will be the output of following python statements?

CO3

I. `print(23 // 5)`

II. `print(2 << 2)`

III. `print(2 >> 0)`

IV. `print(2 ^ 2)`

V. `print(2 != 2)`

VI. `print(2 < 0)`

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Branch : Electronics and Telecommunication/ Electronics and Telecommunication
(Sandwich) Engineering

Semester : IV

Course: B. Tech. Subject Code & Name: BTETC401(Network Theory)

Max Marks: 60

Date: 12/08/2022

Duration: 3.45 Hr.

Instructions to the Students:

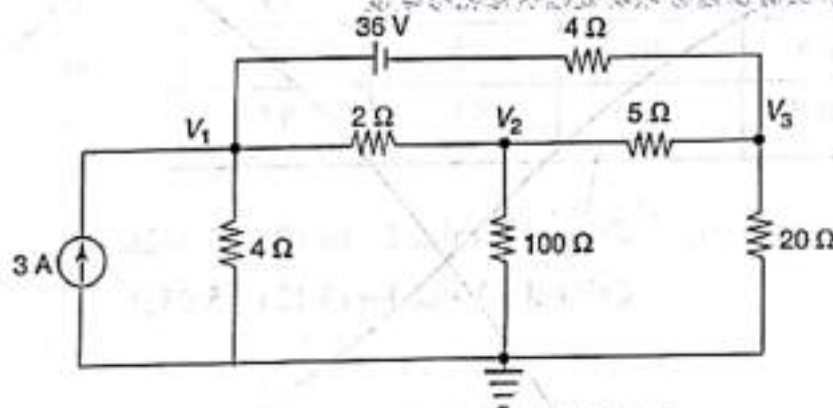
1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and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

(Level/CO) Marks

Q.1 Solve Any Two of the following.

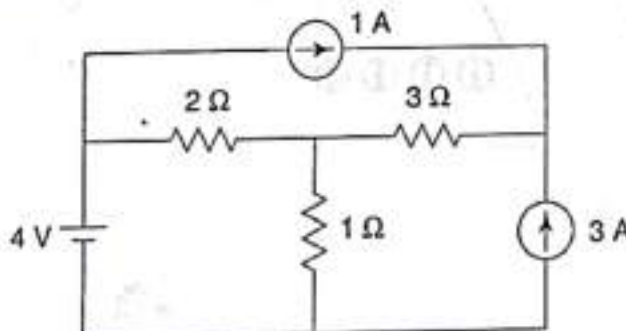
A) For the network shown, find voltages V_1 and V_2 using Node Analysis

CO1 6



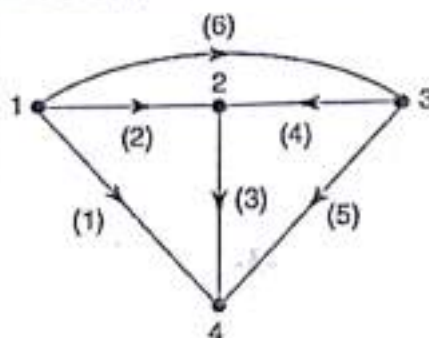
B) State Superposition theorem and Find the current in the 1Ω resistors

CO1 6



C) Define the terms : Branch and Node related to graph of a network and For the graph shown below write the (a) incidence matrix (b) Tie set matrix

CO1 6



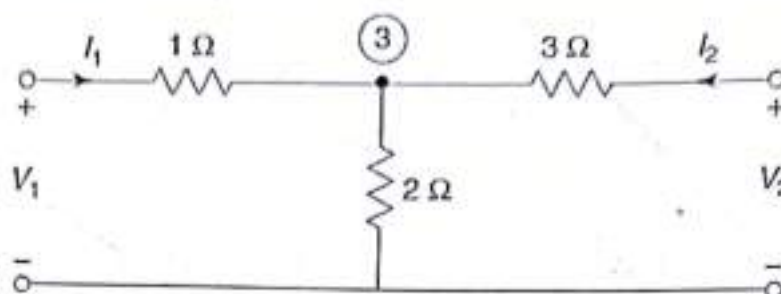
Q.4 Solve Any Two of the following.

A) Derive Y-parameter in terms of h-parameter and ABCD parameter

CO1, CO4 6

B) Find Y-parameters for the network shown. Determine whether the network is symmetrical and reciprocal

CO1, CO4 6



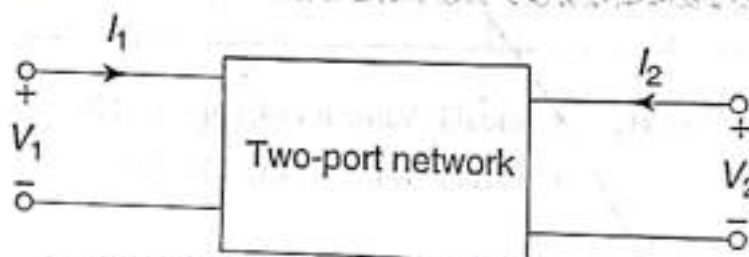
C) Define the terms: Transfer Impedance Function and Transfer Admittance Function.

CO1, CO4 6

In the two-port network shown below, compute h-parameters from the following data:

(a) With the output port short-circuited: $V_1=25V$, $I_1=1A$, $I_2=2A$

(b) With the input port open-circuited: $V_1=10V$, $V_2=50V$, $I_2=2A$



Q.5 Solve Any Two of the following.

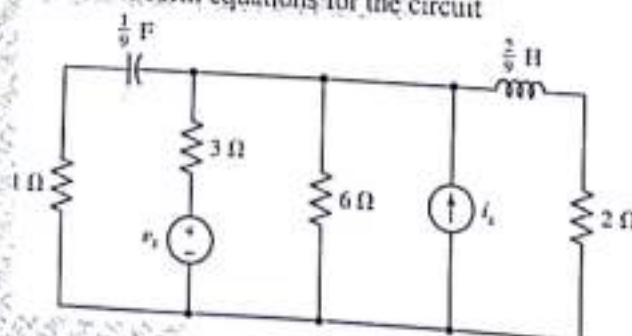
A) Realise Cauer forms of the following LC impedance function.

CO1, CO3 6

$$Z(s) = \frac{10s^4 + 12s^2 + 1}{2s^3 + 2s}$$

B) Write a set of normal-form equations for the circuit

CO1, CO3 6



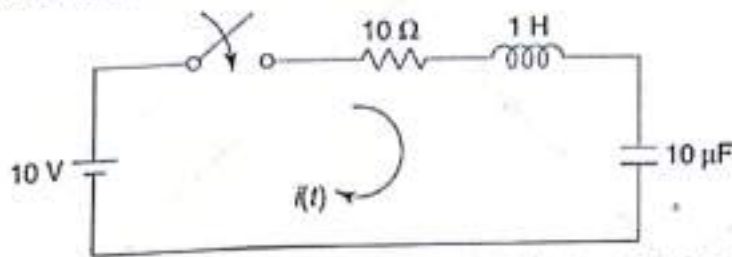
C) Explain about Propagation constant and Characteristic impedance in Π -network filters.

CO1, CO3 6

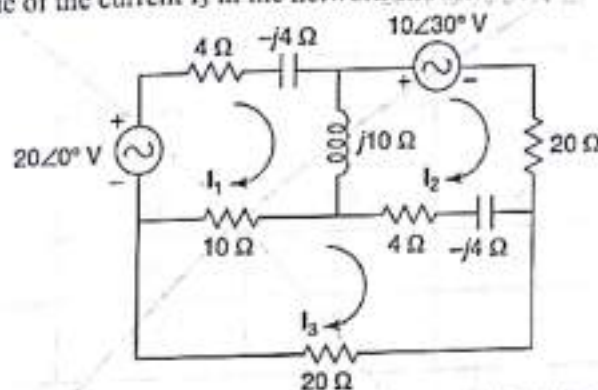
*** End ***

Q.2 Solve Any Two of the following.

- A) In the given network of Fig., the switch is closed. Assuming all Initial conditions as zero, find i , di/dt and d^2i/dt^2 at $t = 0^+$. CO1, CO3 6



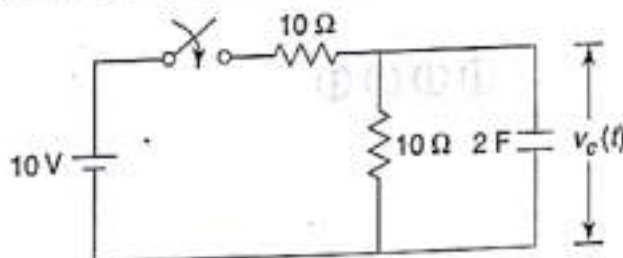
- B) Find the value of the current I_3 in the network shown. CO1, CO3 6



- C) What are initial conditions? Explain the initial conditions for Resistor, capacitor and inductor. CO1, CO3 6

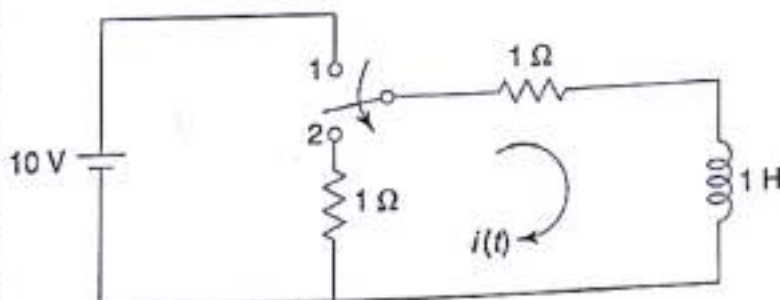
Q.3 Solve Any Two of the following.

- A) The switch in the network shown below switch is closed at $t = 0$. Determine the voltage across Capacitor. CO1 6



- B) Explain the Behaviour of basic elements in Laplace Transform CO1 6

- C) In the network of Fig. given below, the switch is moved from the position 1 to 2 at $t = 0$, steady-state condition having been established in the position 1. Determine $i(t)$ for $t \geq 0$. CO1 6



DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch : Electronics and Telecomm. Engg.

Semester :IV

Subject Code & Name: BTETC402 Signals & Systems

Date: 18/08/2022

Duration: 3.45 Hr.

Max Marks: 60

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.		
A) Find even and odd parts of $x(n) = u(n)$ and plot them.	1	6
B) i) Find that the following system is linear or not $y(t) = tx(t)$ ii) Find that the following system is causal or not: $y(n) = x(-n)$	1	6
C) i) Determine the Nyquist rate for the following signals 1) $x(t) = \sin(200\pi t)$ 2) $x(t) = \sin^2(200\pi t)$ ii) Determine whether $u(t)$ is a power signal or energy signal by finding out the power and energy of the signal	1	3
Q.2 Solve Any Two of the following.		
A) Derive the formula for convolution sum for discrete time LTI systems.	1	6
B) i) Compute the following convolution sum $y(n) = x(n) * h(n)$ $x(n) = h(n) = u(n)$ ii) Compute the following convolution sum $y(n) = x(n) * h(n)$ with the tabular method of convolution sum. $x(n) = \{1, 1, 2, 3\}$, $n=0$ to 3 $h(n) = \{1, 1, 1\}$, $n=0$ to 2	1	6
C) Solve and sketch the following Convolution integral. $x(t) = 1$ for $-1 < t < 1$ $= 0$ otherwise $h(t) = \delta(t+1) + 2\delta(t+2)$	1	6

Q.3 Solve Any Two of the following.

- A) Find the trigonometric Fourier Series for the following signal

$$x(t) = 10t/2\pi, \quad 0 < t < 2\pi$$

- B) 1) State the Dirichlet conditions for the existence of Fourier series.
2) Derive the formula for Trigonometric Fourier Series for the waveforms with even symmetry.

- C) Derive the relationship between Trigonometric and Exponential Fourier Series. i.e. derive the formula of Exponential Fourier Series starting from the formula of Trigonometric Fourier Series.

Q.4 Solve Any Two of the following.

- A) State and prove the following properties of CTFT:

1. linearity
2. time shifting
3. time reversal
4. frequency shifting
5. differentiation in time domain

- B) Find DTFT of $x(n) = a^n u(-n-1)$ for $|a| > 1$. Also find its magnitude and phase.

- C) Find the system frequency response $H(e^{j\omega})$ for $h(n) = 0.5\delta(n) + \delta(n-1) + 0.5\delta(n-2)$. Also plot magnitude and phase response.

Q.5 Solve Any Two of the following.

- A) State the properties of ROC of Z transform.

- B) For the following system functions, check whether the corresponding LTI system is causal, anticausal, or non-causal by finding the inverse Z-Transform in each case.

$$H(z) = \frac{3-4z^{-1}}{1-3.5z^{-1}+1.5z^{-2}} \quad |z| > 3$$

- C) Find the Inverse Laplace transform of

$$H(s) = \frac{-3}{(s+2)(s+2)} \quad \text{for } -2 < R\{s\} < 1$$

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch : Electronics/EXTC/EXTC(sandwich) Semester :IV

Subject Code & Name: BTBS404/BTETC404 Probability Theory and Random

Processes

Max Marks: 60

Date:24/08/2022

Duration: 3.45 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) 1) Explain the axiomatic definition of probability along with axioms. (L1/CO1) 6

2) A card is drawn at random from 52 cards. Find the probability of its being

- i. an Ace
- ii. a Six or a Heart
- iii. Neither a Nine nor a Spade

B) A discrete RV has following probability distribution (L1/CO1) 6

x	0	1	2	3	4	5	6	7	8
P(x)	k	3k	5k	7k	9k	11k	13k	15k	17k

Find the value of k, $P(X < 3)$ and distribution function of X.

C) A fair coin is tossed 4 times. Define the sample space corresponding to this random experiment. Also give the subsets corresponding to the following events and find the respective probabilities. (L1/CO1) 6

- i. More Heads than Tails are obtained
- ii. Tails occurred on the even numbered tosses

Q.2 Solve Any Two of the following.

A) Define the following terms along with examples (L1/CO2) 6

- i. Joint Probability
- ii. Conditional Probability
- iii. Independence

B) A continuous random variable X that can assume any value between $x = 2$ and $x = 5$ has a density function given by $f_X(x) = k(1 + x)$. Find the value of $p(X < 4)$. (L1/CO2) 6

C) One out of 5 students at a local college say that they skip breakfast in the morning. Find the mean, variance and standard deviation if 10 students are randomly selected. (L2/CO2) 6

Q.3 Solve Any Two of the following.

- A) Find the covariance matrix for given data $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$, covariance matrix = $\begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$. (L1/CO3) 6
- B) In café, customer arrives at rate of 2 per minute. Find the probability of arrival of 5 customers in 1 minute using Poisson distribution. (L2/CO3) 6
- C) Show if given inner product is valid or not. If $\alpha = (a_1, a_2), \beta = (b_1, b_2) \in V_2(R)$. (L1/CO3) 6
- Prove: $\langle \alpha, \beta \rangle = a_1 b_1 - a_2 b_1 - a_1 b_2 + 4 a_2 b_2$

Q.4 Solve Any Two of the following.

- A) Prove that if there is convergence in probability then there is convergence in distribution. (L1/CO4) 6
- B) Explain the difference between Weak law of large numbers and Strong law of large numbers. (L1/CO4) 6
- C) Explain in detail with proof Central limit theorem. (L1/CO4) 6

Q.5 Solve Any Two of the following.

- A) 1) Define Autocorrelation function with all its properties. (L1/CO5) 6
- 2) If $X(t)$ is WSS process with autocorrelation $R(\tau) = Ae^{-\alpha|\tau|}$ then determine the second order moment of RV $X(8) - X(5)$.
- B) Explain in brief Strict Sense Stationary (SSS) process and Wide Sense Stationary (WSS) process. (L2/CO5) 6
- C) Define random process along with its classification. Also define Mean, Autocorrelation and Autocovariance in terms of random process. (L1/CO5) 6

*** End ***



DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE
Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch : Electrical Engg. & Allied Branches

Semester : IV

Subject Code & Name: (BTEEC402) POWER SYSTEM

Max Marks: 60

Date: 18/08/2022

Duration: 3.45 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) Draw the schematic diagram of Thermal power plant and explain function of its main component.	(Remember)	6
B) Explain the major equipments used in electrical substation of power plant.	(Understand)	6
C) Draw the schematic diagram of Nuclear power plant and explain function of its main component.	(Remember)	6
Q.2 Solve Any Two of the following.		
A) Write a short note on transposition of power lines.	(Remember)	6
B) Explain the concept of self GMD for evaluating inductance of transmission lines.	(Understand)	6
C) Write a short note on Skin Effect, Ferranti Effect, Proximity Effect.	(Remember)	6
Q.3 Solve Any Two of the following.		
A) Discuss the advantages and disadvantages of (i) pin-type insulators (ii) suspension type insulators.		6
B) Why are insulators used with overhead lines? Discuss the desirable properties of insulators.	(Application)	6
C) Discuss the various conductor materials used for overhead lines.	(Remember)	6
Q.4 Solve Any Two of the following.		
A) Discuss the terms voltage regulation as applied to transmission line	(Application)	6
B) Explain the classification of lines based on their length of transmission.	(Remember)	6
C) Deduce an expression for voltage regulation of a short transmission line, giving the vector diagram.	(Analysis)	6
Q.5 Solve Any Two of the following.		
A) Write short notes on the following : (i) Distribution transformers (ii) 3-wire d.c. distribution	(Remember)	6
B) What are the design considerations of distribution system? Explain.	(Understand)	6
C) What are the advantages and disadvantages of d.c. transmission over a.c. transmission?	(Remember)	6

*** End ***

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Shri Balasaheb Mane Shikshan Prasarak Mandal, Ambap's

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QUESTION PAPER: (BE/ME/MBA)

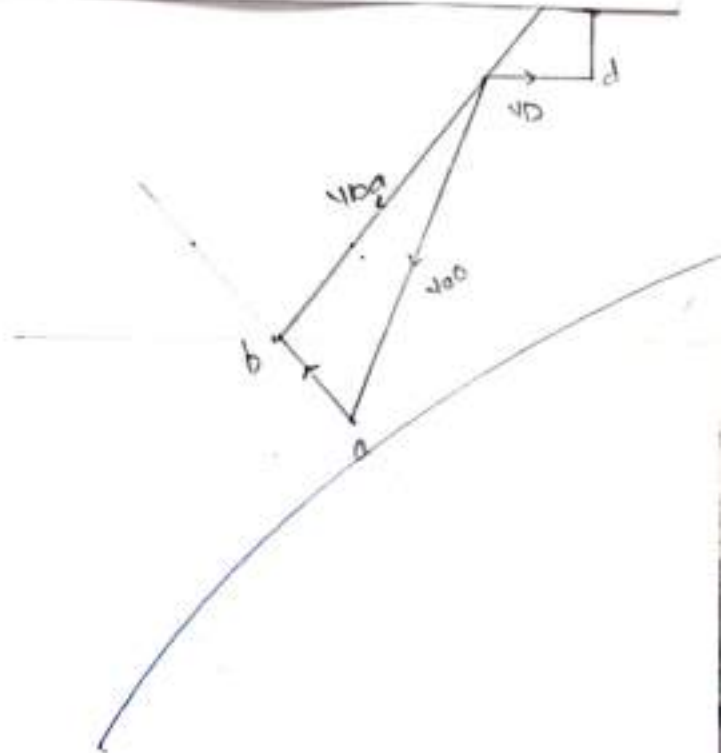
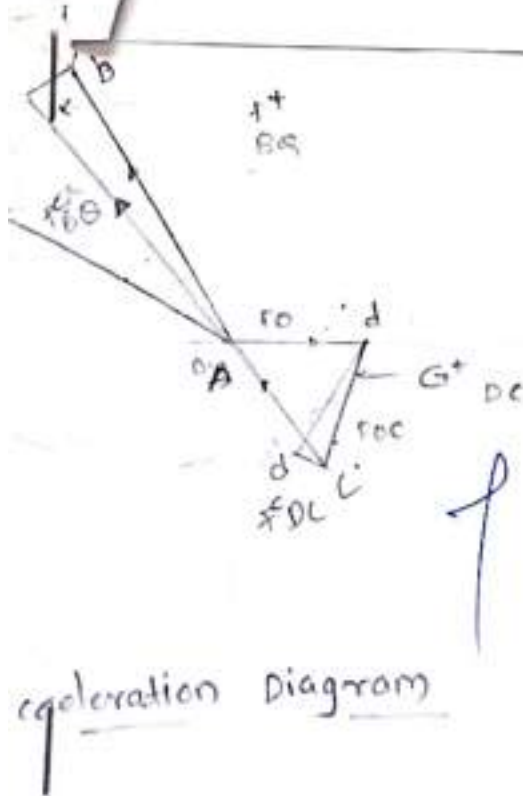
Class: SY

Dept: Mechanica

Exam date:

/ / 20

Paper Quantity:.....5.....



DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch : Mechanical Engineering

Semester : IV

Subject Name: Strength of Materials

Subject Code: BTMES404

Max Marks: 60

Date: 24/08/2022

Duration: 3.45 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 Attempt Any Two

A) Derive an expression for deformation of uniformly tapering circular cross-sectional body

(CO1) 6

B) A composite bar made of copper, steel and brass is rigidly attached to the end supports as shown in figure 01. Determine the stresses in the three portions of the bar when the temperature of the composite system is raised by 70°C when

i) The supports are rigid ii) the supports yield by 0.6 mm.

$E_c = 100 \text{ GPa}$, $E_s = 205 \text{ GPa}$, $E_b = 95 \text{ GPa}$

$\alpha_c = 18 \times 10^{-6} / ^{\circ}\text{C}$, $\alpha_s = 11 \times 10^{-6} / ^{\circ}\text{C}$,

$\alpha_b = 19 \times 10^{-6} / ^{\circ}\text{C}$

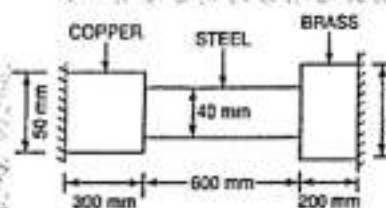


Figure 01

C) A plane element in a boiler is subjected to tensile stresses of 400 MPa on one plane and 150 MPa on the other at right angle. Each of the above stresses is accomplished by a shear stress of 100 MPa such that when associated with the minor stress tends to rotate the element in anticlockwise direction. Find;

(CO3) 6

- i. Principal stresses and their direction
- ii. Maximum shear stress

Q.2 Attempt Any Two

A) A wagon weighing 20 kN is attached to a wire rope and is moving at the speed of 5.4 kmph. The rope suddenly jams and wagon is brought to rest. If length of rope is 50 m and diameter is 36 mm, find maximum instantaneous stress and elongation of rope. Take $E = 200 \text{ GPa}$.

(CO2) 6

B) A rectangular pier is subjected to a compressive load of 450 kN as shown in figure 02. Find stress intensities on all the four corners of the pier.

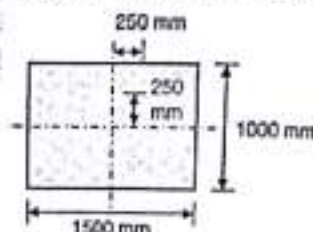


Figure 02

(CO3) 6

- C) Interpret a relationship between rate of loading, shear force and bending moment (CO4) 6

Q.3 Attempt Any Two

- A) An I-section beam 350 mm X 150 mm has a web thickness 10 mm & flange thickness 20 mm. If the shear force acting on the section is 40 kN, then find;
 a) Maximum shear stress developed in the section (CO3) 6
 b) Sketch the shear stress distribution diagram
 c) Total shear force carried by web
 B) Derive an expression for Flexural equation along with assumptions (CO2) 6
 C) A beam of T-section, 4 m long carries a uniformly distributed load 'w' per meter run throughout its length. The beam is simply supported at its ends. The T-section has web 18.8 cm X 1.2 cm and flange is 10 cm X 1.2 cm. What is the maximum value of 'w', so that the stress in the section does not exceed 60 MPa? (CO3) 6

Q.4 Attempt Any Two

- A) Derive an expression for Torsional formula along with assumptions (Understand) 6
 B) A Hollow shaft with diameter ratio of 3/8 is required to transmit 500 kW at 100 rpm, the maximum torque being 20% greater than mean. The maximum shear stress is not to exceed 60 N/mm² and the twist in the length of 3 m is not to exceed 1.4°. Calculate the minimum diameter required for the shaft. Take $G = 84 \text{ N/mm}^2$. (Apply) 6
 C) A hollow CI column of external diameter 200 mm, length 4 meter with both the ends fixed, supports an axial load of 800 kN. Determine the thickness of the column required by using Rankine's formula taking constant of 1/6400 & working stress at 80 MN/m². (Apply) 6

Q.5 Attempt Any Two

- A) Draw shear force and bending moment diagrams for the beam loaded as shown in figure 03

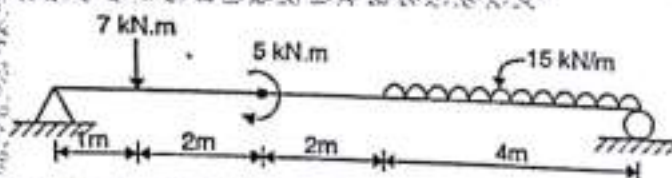


Figure 03

- B) Draw shear force and bending moment diagrams for the cantilever beam as shown in figure 04

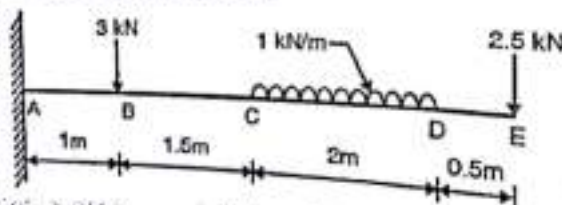


Figure 04

- C) A beam ABCD has an internal hinge at B and is loaded shown in figure 05. Plot shear force and bending moment diagrams and locate point of contra flexure. (CO4) 6

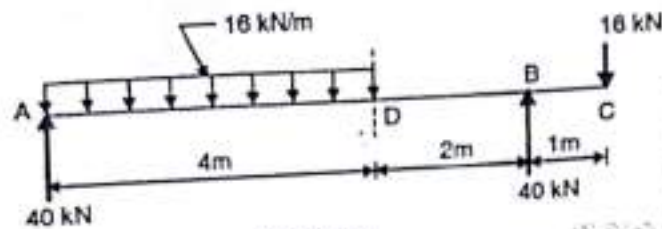


Figure 05

*** END ***



DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

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

Subject Code & Name: BTMC402 Theory of Machines I

Max Marks: 60

Date: 18/08/22

Duration: 3.45 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 calculator is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

(Level/CO) Marks

Q.1 Solve the following.

- A) Fig. 1 shows part of an opposed piston engine mechanism. The velocity of the piston E for the given instant is 780 mm/s. the crank OA rotates at a uniform speed in a clockwise direction and makes an angle of 45° to vertical as shown in Fig. 1. Draw a velocity diagram and determine the speed of the crank in rpm. OA= 50mm, AB= 200 mm, BC= 110 mm, CD= 220 mm and DE= 100 mm.

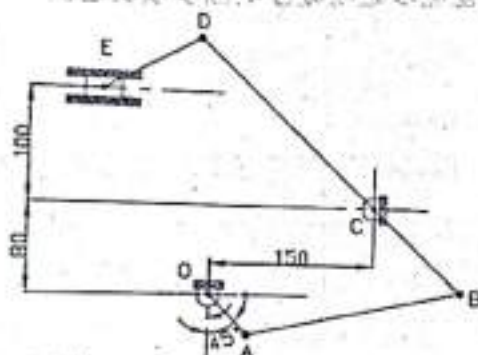


Fig. 1

- B) Explain with sketches different types of constrained motions.

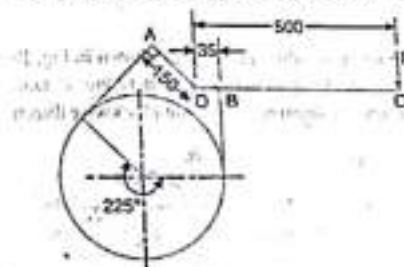
Q.2 Solve Any Two of the following.

- A) A shaft has a number of collars integral with it. The external diameter of the collar is 400 mm and the shaft diameter is 250 mm. if the intensity of the pressure is 0.35 N/mm^2 and the coefficient of friction is 0.05. Estimate power absorbed when the shaft runs at 105 rpm carrying a load of 150 kN and a number of collars required.
- B) Derive the expression for a total torque acting on a truncated conical pivot bearing considering uniform wear,
- C) A conical pivot supports a load of 20 kN, the cone angle is 120° and the intensity of normal pressure is not to exceed 0.3 N/mm^2 . The external

diameter is twice the internal diameter. Find the outer and inner radii of the bearing surface. If the shaft rotates at 200 rpm and the coefficient of friction is 0.1. Find the power absorbed in friction. Assume uniform pressure.

Q. 3 Solve Any Two of the following.

- A) A centrifugal clutch is to transmit 15 kW at 900 rpm. The shoes are four in number. The speed at which the engagement is $3/4^{\text{th}}$ of the running speed. The inside radius of the pulley rim is 150 mm and the center of gravity of the shoe lies at 120 mm from the center of the spider. The shoes are lined with Ferrodo for which the coefficient of the friction may be taken as 0.25. Determine the mass of the shoes and size of the shoes, if the angle subtended by the shoes as the center of the spider is 60° and the pressure exerted on the shoes is 0.1 N/mm^2 . **Apply** 6
- B) A differential band brake as shown in Fig. 2 has an angle of contact of 225° . The band has a compressed woven lining and bears against a cast iron drum of 350 mm diameter. The brake is to sustain a torque of 350 Nm and the coefficient of friction between the band and drum is 0.3. Find the necessary force 'P' for the clockwise rotation of the drum and the value of 'OA' for the brake to be self-locking when the drum rotates in clockwise. **Apply** 6



All dimensions in mm.

Fig. 2

- C) Differentiate between absorption type dynamometers and transmission type dynamometers. **Remember** 6

Q.4 Solve the following.

- A) Draw the profile of a cam operating a roller reciprocating follower having a lift of 40 mm, the roller diameter is 20 mm, the minimum radius of the cam is 30 mm, the cam raises the follower with simple harmonic motion for 110° of its rotation followed by a period of dwell for 80° , the follower descends for the next 120° rotation of the cam follower with uniform acceleration and deceleration followed by a dwell period. **Apply** 6

B) Explain with figures any three types of followers.

Remember 6

Q. 5 Solve Any Two of the following.

A) Explain the direct and reverse crank method for determining unbalanced forces in radial engines.

Remember 6

B) Explain the method of balancing of several masses in the same planes.

Remember 6

C) A four-cylinder vertical engine has cranks 150 mm long. The planes of rotation of the first, second and fourth cranks are 400 mm and 200 mm respectively from the third crank and their reciprocating masses are 50 kg, 60 kg and 50 kg respectively. Find the mass of the reciprocating parts for the third cylinder and the relative angular positions of the cranks in order that the engine may be in complete primary balance.

Apply 6

*** End ***



Q.3 Solve Any Two of the following.

- | | | |
|--|-----------------------|---|
| A) Define the term Governing of Turbine. With neat sketch explain the working of oil pressure governor. | Understanding/
CO5 | 6 |
| B) What are the characteristics curves of turbine? Plot and explain main characteristics curves for Impulse turbine. | Understanding/
CO3 | 6 |
| C) Define the unit quantities for the turbine. | Understanding/
CO4 | 6 |

Q.4 Solve Any Two of the following.

- | | | |
|---|-----------------------|---|
| A) Define phenomenon of cavitation and explain the effect of cavitation. | Understanding/
CO3 | 6 |
| B) A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 rpm works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes angle is 40° at the outlet. If the outer diameter of impeller is 500 mm and width at the outlet is 50 mm. Determine
1. Vane angle at inlet 2. Work done by impeller on water per second
3. Manometric Efficiency. | Applying/CO6 | 6 |
| C) Derive the expression for specific speed of pump. | Understanding/
CO6 | 6 |

Q.5 Solve Any Two of the following.

- | | | |
|--|-----------------------|---|
| A) With neat sketch explain the construction and working of single acting reciprocating pump. | Understanding/
CO6 | 6 |
| B) Enlist and explain the causes of failure of pumping systems. Also suggest remedies to avoid failure of pumping systems. | Understanding/
CO7 | 6 |
| C) Classify special purpose pumps and list out their applications (At least 4 types and their applications). | Understanding/
CO6 | 6 |

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch : Mechanical Engineering

Semester IV

Subject Code & Name: BTMPE405C Fluid Machinery

Max Marks: 60

Date: 27-08-2022

Duration: 3.45 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) Obtain an expression for force exerted and work done by jet of water on flat vertical plate moving in the direction of jet.	Understanding/ CO1	6
B) A jet of water of diameter 10 cm strikes flat plate normally with velocity of 15 m/s. The plate is moving with velocity of 6 m/s in the direction of jet and away from the jet. Find 1. Force exerted by the jet on the plate 2. Work done by the jet on the plate 3. Power of jet in kW	Applying/CO1	6
C) Define the following terms 1. Degree of Reaction 2. Overall Efficiency 3. Mechanical Efficiency	Understanding/ CO2	6
Q.2 Solve Any Two of the following.		
A) A Pelton wheel is to be designed for the head of 60 m when running at 200 rpm. The Pelton wheel develops 95.6475 kW shaft power. The velocity of buckets equal to 0.45 times the velocity of the jet. Overall efficiency is 0.85 and coefficient of friction is equal to 0.98. Find out 1. Diameter of jet 2. Diameter of wheel 3. Width and depth of bucket	Applying/CO4	6
B) Explain the significance of draft tube and describe different types of draft tubes neat sketches.	Understanding/ CO3	6
C) With neat sketch explain construction and working of Kaplan turbine.	Understanding/ CO2	6

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch: Multiple Branches

Semester : IV

Subject Code & Name: (BTHM403) Basic Human Rights

Max Marks: 60

Date: 20/08/2022

Duration: 3.45 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.

Q.1 Solve any One of the following

A) Write short notes on:

- i) Liberty
- ii) Equality
- iii) Fraternity

B) Write short notes on:

- i) Civil society
- ii) State
- iii) Industrialism and the present social system

(Level/CO) Marks

L2/CO2 12

L2/CO2 12

Q.2 Solve any Two of the following

A) What is the contribution of the French Revolution to the human rights movement?

L3/CO1 6

B) Explain the following concepts:

- i) Interrelationship between religion and culture
- ii) Communal riots and social harmony

L3/CO1 6

C) Elaborate the following terms:

- i) Unemployment
- ii) Rural poverty

L3/CO1 6

Q.3 Solve any Two of the following

A) Throw light on the rights of migrant workers.

L5/CO5 6

B) How will you focus on the rights of mentally and physically challenged people? Elaborate.

L5/CO5 6

C) 'Freedom is the soul of democracy'. Justify.

L5/CO5 6

Q.4 Solve the following

A) Elaborate the contribution of NGOs in India to help people get their rights in regard with:

L4/CO4 12

a) Water

b) Forest

c) Land

Q.5 Solve any Two of the following

A) Illustrate the fundamental rights in the Constitution of India?

L2/CO3 6

B) What duties are suggested by the Constitution of India? Explain.

L2/CO3 6

C) What is UDHR, what are its provisions in India?

L2/CO3 6

*** End ***

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.

Branch : Mechanical

Semester : IV

Subject Code & Name: BTMPE405A- Numerical Methods in Engg.

Max Marks:60

Date: 27/8/2022

Duration: 3.45 Hr.

Instructions to the Students:

1. All Questions are Compulsory
2. Draw neat diagram wherever necessary.
3. Figures to right indicates full marks
4. Assume suitable data wherever necessary and mention it clearly

	(Level/CO)	Marks
Q.1 Solve Any Two of the following.		
A) Define and Explain the precision and Accuracy with an example	CO1	06
B) The discharge Q over a notch for head H is calculated by the formula $Q = kH^{3/2}$ where 'k' is given constant. If the head is 75cm and an error of 0.15cm is possible in its measurement, estimate the percentage error in computing the discharge.	CO1	06
C) Explain with an example error Propagation with example	CO1	06
Q.2 Solve Any Two of the following.		
A) The bacteria concentration (C) in a reservoir varies as $C = 4e^{-2t} + e^{-0.5t}$. Calculate the time required for bacteria concentration to be 0.5	CO2	06
B) Using Bisection method find positive root for $\sqrt{32}$ upto three decimal places	CO3	06
C) Using Newton Raphson method, find a root upto three decimal place for the $x^3 + 2x^2 + 10x - 20 = 0$ take $x_0 = 1$	CO2	
Q.3 Solve Any Two of the following.		
A) Solve by Gauss Elimination Method	CO2	06
$10x - 7y + 3z + 5u = 6$ $-6x + 8y - z + 4u = 5$ $3x + y + 4z + 11u = 2$ $5x - 9y - 2z + 4u = 7$		
B) Solve by Crammers rule	CO2	06
$x + 3y + 6z = 2$ $3x - y + 4z = 9$ $x - 4y + 2z = 7$		
C) A fruit seller selling different size mangoes. He sell a small size magno for Rs 3/-, medium size mango for Rs 5/-, and large size mango for Rs 7/-. The seller sells total 15 mangos and has made Rs 77/-. He has sold 2 more medium size mangos than small mangos. How many of each size did he sell.	CO3	06

Q.4 Solve Any Two of the following.

CO2 06

A) Evaluate the $\int_0^1 \left(\frac{1}{x^2+1} \right) dx$ by using two point Simpsons 1/3 rule

CO2 06

B) Evaluate the $\int_0^{0.5} \left(\frac{x}{\sin x} \right) dx$ using Trapezoidal method

CO3 06

C) A train is moving at the speed of 30 m/s. Suddenly the brakes are applied. The speed of the train per second after 't' is given by

Time 't' in second	0	5	10	15	20	25	30	35	40	45
Speed 'v' in m/s	30	24	19	16	13	11	10	8	7	5

Estimate the distance moved by the train in 45 seconds

Q.5 Solve Any Two of the following.

CO3 06

A) A chemical factory wishing to study the effect of the extraction time (T) on the efficiency of an extraction operation (E) obtained data is as shown in the table. Fit a straight line to given data by least square method

T	27	45	41	19	35	39	19	49	15	31
E	57	64	80	46	62	72	52	77	57	68

B) Given $\frac{dy}{dx} = \frac{y-x}{y+x}$ with $y(0)=1$. Find $y(0.1)$ using modified Eulers method

CO2 06

C) Find $y(0.2)$ by using Runge-Kutta method taking $h=0.1$ and $y(0)=1$ from the system of equation, $dy/dx = x + y^2$

CO2 06

*** End ***

