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

Semester: FY. B.Tech. 1st sem

Class: FY. B.Tech

Year: Feb.2025

Department: All Branch

1. Civil Engineering
2. Mechanical Engineering
3. Computer Science and Engineering
4. Electronics and Tel communication Engineering
5. Electrical Engineering
6. AIDS
7. Computer Science And Electronics Engineering

FY. All Branch.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular/Supplementary Winter Examination – 2024

Course: Engineering **Branch: Common To All Branches**

Semester : 1st Sem

Subject Code & Name: 24AF2CMEES108 (Basic Civil and Mechanical Engineering)

Max Marks: 60 **Date: 22/02/2025** **Duration: 3 Hr.**

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

					(Level/CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**				Remember	**12**
1	A……. is a horizontal member which is placed across an opening to support the position of the structure above it.					1
	a. Doors	b. Windows	c. Sill	d. Lintel		
2	what is the primary function of a shallow foundation					1
	a. To transfer loads to a deeper	b. To distribute loads over a larger area to reduce soil pressure	c. To provide Lateral Support to the superstructure	d. To resist uplift forces		
3	What is the primary function of cement in concrete?					1
	a. To provide Strength	b. To improve workability	c. To reduce shrinkage	d. To increase durability		
4	The entire assembly of styles, Pannels & rails is known as the……					1
	a Putty	b. Horn	c. Sash	d. Shutter		
5	What is surveying?					1
	a. To find elevations w.r to datum	b. Show's the relative positions of the object on the	c. To find elevations of points having	d. All of above		

		surface of the earth	same contour intervals			
6	What is the term used for an imaginary line on the ground Joining of equal elevations					1
	a. Level Line	b. Line of sight	c. Datum	d. Contour		
7	Which of the following kind of energy output is obtained from a 'Steam Power Plant'					1
	a. Electricity	b. Thermal energy	c. Sound energy	d. Heat energy		
8	Which of the following is a classification of automobiles based on Load?					1
	a. Heavy transport vehicle (HTV)	b. Sedan Hatchback car	c. Four wheeler vehicle	d. Front-wheel drive		
9	Petrol engines are..... than diesel engines.					1
	a. Lighter	b.Unpredictable	c. Heavier	d. None of the mentioned		
10	Which of the following is a type of thermodynamic system?					1
	a. Open system	b. Closed system	c. Thermally isolated system	d. All of the mentioned		
11	Sand mold and permanent mold are the parts of..... manufacturing process.					1
	a. Machining	b. Casting	c. Welding	d. None of above		
12	Which of the following operation is not carried out on Lathe Machine.					1
	a. Welding	b. Facing	c. Turning	d. Parting		
Q. 2	**Solve the following.**				**CO2**	**12**
A)	Describe in detail concrete with its types & properties?					6
B)	Explain the role of Civil engineer in the field of Construction engineering?					6

Q.3	**Solve the following.**	**CO3**	**12**
A)	Explain the foundation with its types & function of foundation?		6
B)	Describe in detail 'lean to roof" with sketch?		6
Q.4	**Solve Any Two of the following.**	**CO4**	**12**
A)	Describe in detail "Metric chain" with sketch?		6
B)	Describe Advantages & Disadvantages of "Plane Table surveying"?		6
C)	Define the terms? i) Reduced level ii) Height of instrument iii) Contour line iv) Bench marks v) Change Point vi) Contour interval		6
Q.5	**Solve Any Two of the following.**	**CO5**	**12**
A)	Describe first law of thermodynamics. Enlist the limitations of the same?		6
B)	Classify Internal combustion engines based on (i) Cycle of operation, ii) Fuel used, iii) Cylinder Arrangement, (iv) No. of strokes, (v) Application, (vi) Ignition method.		6
C)	What is the function of Power plant. Explain in brief working of thermal power plant with suitable sketch?		6
Q. 6	**Solve Any Two of the following.**	**CO5**	**12**
A)	What is the difference between machine and mechanism? Explain any two types of mechanism with suitable diagrams.		6
B)	Classify engineering materials. Describe in detail properties and applications of any two non-ferrous metals?		6
C)	With suitable diagrams describe any six operations performed on Lathe machine?		6
	***** End *****		

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2024

Course: B.Tech **Branch : Common To All Branches** **Semester : I**

Subject Code & Name: BTES105 - Energy and Environment Engineering

Max Marks: 60 **Date:22/02/2025** **Duration: 3 Hr.**

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

					(Level/CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**					**12**
1	Which of the following is a disadvantage of a steam power station?				**CO1**	**1**
	a. High efficiency	b. Low operational cost	c. High fuel consumption	d. Low maintenance cost		
2	Which renewable energy source is utilized in the Ocean Thermal Energy Conversion (OTEC)?				**CO1**	**1**
	a. Solar	b. Wind	c. Tidal	d. Biomass		
3	Which of the following is NOT a component of a gas turbine power plant?				**CO2**	**1**
	a. Compressor	b. Heat exchanger	c. Reactor	d. Turbine		
4	What is the primary environmental concern associated with nuclear power plants?				**CO2**	**1**
	a. High greenhouse gas emissions	b. Waste disposal	c. Water pollution	d. Land degradation		
5	The maximum energy efficiency principle is part of which aspect of energy?				**CO2**	**1**
	a. Energy conservation	b. Energy generation	c. Energy transmission	d. Energy storage		
6	Which method is used to conserve energy in air conditioning systems?				**CO3**	**1**

	a. Reducing compressor load	b. Increasing fan speed	c. Using high-efficiency motors	d. Increasing cooling temperature		
7	Which of the following is a source of water pollution?				CO3	1
	a. Smoke from factories	b. Industrial discharge into rivers	c. Light emissions from vehicles	d. Noise from construction sites		
8	Which of the following is NOT a cause of air pollution?				CO3	1
	a. Carbon emissions from vehicles	b. Smoke from forest fires	c. Chlorofluorocarbons (CFCs)	d. Noise from traffic		
9	Biomass energy is primarily derived from:				CO4	1
	a. Fossil fuels	b. Living organisms	c. Wind	d. Water		
10	In energy conservation, what is the main advantage of using energy-efficient lighting systems?				CO4	1
	a. Increased power consumption	b. Higher installation costs	c. Reduced energy consumption	d. Increased brightness		
11	What type of pollution is mainly associated with the burning of fossil fuels?				CO5	1
	a. Water pollution	b. Air pollution	c. Noise pollution	d. Soil pollution		
12	Which energy source involves the conversion of thermal energy from the ocean into electricity?				CO5	1
	a. Wind energy	b. Ocean Thermal Energy Conversion (OTEC)	c. Solar energy	d. Biogas		
Q. 2	**Solve the following.**					12
A)	Explain the schematic arrangement, advantages, and disadvantages of a steam power station.				CO1	6
B)	Describe the environmental aspects for selecting the sites and locations of power plants.				CO1	6

Q.3	**Solve the following.**		12
A)	Discuss the schematic arrangement, advantages, and disadvantages of a solar power plant.	**CO2**	**6**
B)	Explain the working principle of Magneto Hydro Dynamics (MHD) power generation.	**CO2**	**6**
Q. 4	**Solve Any Two of the following.**		12
A)	Explain the scope for energy conservation in electric furnaces and its benefits.	**CO3**	**6**
B)	Describe the methods and techniques of energy conservation in ventilation systems.	**CO3**	**6**
C)	Discuss the advantages and disadvantages of biogas as a renewable energy source.	**CO3**	**6**
Q.5	**Solve Any Two of the following.**		12
A)	Explain the effects of air pollution on human health and the environment.	**CO3**	**6**
B)	Discuss the control measures for particulate emissions in industries.	**CO4**	**6**
C)	Describe the control measures for noise pollution in urban areas.	**CO5**	**6**
Q. 6	**Solve Any Two of the following.**		12
A)	Explain the effects and control measures of water pollution caused by industrial discharge.	**CO3**	**6**
B)	Discuss the disposal methods of solid wastes and bio-medical wastes.	**CO4**	**6**
C)	Explain the concept of thermal pollution and its environmental impact.	**CO5**	**6**
	***** End *****		

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular/Supplementary Winter Examination – 2024

Course: B.Tech Branch : Common To All Branches Semester : I

Subject Code & Name: 24AF1000ES106 & Basic Electrical & Electrionics Engineering

Max Marks: 60 Date:13/02/2025 Duration: 3 Hr.

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
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		(Level/CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**		**12**
1	What is the equivalent resistance when two 4Ω resistors are connected in parallel? A) 2Ω B) 4Ω C) 8Ω D) 1Ω	CO1	1
2	In nodal analysis, the unknown variables are A) Currents in each branch B) Voltage at each node C) Resistance of each branch D) Inductance of each loop	CO3	1
3	In a purely capacitive AC circuit, the current A) Leads the voltage by 90° B) Lags the voltage by 90° C) Is in phase with voltage D) Is zero	CO2	1
4	What is the purpose of back EMF in a DC motor? A) To increase the current in the armature B) To regulate the speed of the motor C) To reduce torque in the motor D) To stop the motor from running	CO1	1
5	The working principle of an induction motor is based on A) Mutual Induction B) Self Induction C) Fleming's Right-Hand Rule D) Static Magnetic Field	CO2	1
6	In a PN junction diode, current conduction in forward bias is mainly due to A) Electrons only B) Holes only C) Both electrons and holes D) Majority carriers only	CO1	1
7	In a DC power supply, the function of a rectifier is to A) Convert AC to DC B) Convert DC to AC C) Convert DC to DC D) Regulate voltage	CO1	1

8	In a Zener diode voltage regulator, the output voltage A) Varies with input voltage B) Remains constant if input voltage is within limits C) Is always equal to input voltage D) Depends on load current only				CO3	1
9	In an NPN transistor, the majority charge carriers in the base are A) Electrons B) Holes C) Both electrons and holes D) Ions				CO2	1
10	The DC load line of a transistor amplifier circuit helps in A) Determining the operating point B) Reducing power consumption C) Increasing gain D) Decreasing leakage current				CO3	1
11	A moving coil instrument operates on the principle of A) Electromagnetic induction B) Electrostatic force C) Magnetic field interaction D) Heating effect of current				CO1	1
12	In a function generator, which parameter cannot be adjusted directly? A) Frequency B) Waveform shape C) Output voltage D) Load resistance				CO2	1
Q.2	**Solve the following.**					**12**
A)	**State and explain Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL).**				CO1	6
B)	**A resistor of 10Ω is connected across a 230V, 50Hz AC supply.** Find: (a) The RMS current (b) The power dissipated in the resistor				CO1	6
Q.3	**Solve the following.**					**12**
A)	Define and derive the expression for the RMS (Root Mean Square) value of a sinusoidal waveform.				CO3	6
B)	Define back EMF in a DC motor and derive the torque equation of a DC motor				CO2	6
Q.4	**Solve Any Two of the following.**					**12**
A)	Explain the working of a full-wave bridge rectifier				CO1	6
B)	Explain the function of a capacitor filter in a rectifier circuit.				CO3	6
C)	A full-wave rectifier is supplied with a 230V RMS AC input. If the transformer has a turns ratio of 10:1, calculate: a) The secondary voltage b) The peak output voltage (Assume diode drop = 0.7V)				CO2	6

Q.5	**Solve Any Two of the following.**		**12**
A)	Derive the relationship between current gains (α and β) in Common Base (CB) and Common Emitter (CE) configurations.	CO2	**6**
B)	Explain the construction and working principle of PNP.	CO3	**6**
C)	Explain the construction and working principle of a DC motor.	CO1	**6**
Q.6	**Solve Any Two of the following.**		**12**
A)	Explain the construction and working of a Moving Iron instrument.	CO3	**6**
B)	Draw and explain the block diagram of a digital multimeter.	CO2	**6**
C)	Describe the operation of a function generator.	CO1	**6**

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Examination Winter – 2024

Course: B. Tech. **Branch: All Branches** **Semester: I**

Subject Code & Name: (BTHM104) Communication Skills

Max. Marks: 60 **Date: 13/02/2025** **Duration: 3 Hrs.**

Instructions to the Students:

1. Each question carries 12 marks.
2. Question No. 1 will be compulsory and include objective-type questions.
3. Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.
4. 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.
5. Use of non-programmable scientific calculators is allowed.
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		(Level/CO)	Marks
Q. 1)	**Objective type questions. (Compulsory Question)**		**12**
i)	What of the following is the primary purpose of a group discussion? a. To share information b. To build relationships c. To make decisions d. All of the above	**L1/CO1**	1
ii)	Which of the following is an example of verbal communication? a. Written communication b. Body language c. Tone of voice d. Facial expressions	**L1/CO1**	1
iii)	What is the importance of non-verbal communication? a. It conveys emotions b. It reinforces verbal messages c. Both of the above d. None of the above	**L1/CO1**	1
iv)	..... is a barrier to effective communication. a. Language differences b. Cultural differences c. Both of the above d. None of the above	**L1/CO1**	1
v)	..... is the primary purpose of reading? a. To entertain b. To educate c. To inform d. All of the above	**L1/CO1**	1
vi)	..... is the result of effective communication. a. Misunderstanding b. Conflict	**L1/CO1**	1

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c. Mutual understanding
d. None of the above

vii) What is the primary purpose of listening? **L1/CO1**
a. To understand
b. To ignore
c. To teach a lesson
d. None of the above

viii) Effective listening **L1/CO1**
a. Improves comprehension
b. Decreases retention
c. Spoils relationships
d. None of the above

ix) ..... is the importance of using appropriate language in oral communication. **L1/CO1**
a. To convey respect
b. To build relationships
c. To communicate effectively
d. All of the above

x) ..... is a form of non-verbal communication. **L1/CO1**
a. Written communication
b. Verbal communication
c. Body language
d. None of the above

xi) Which of the following can be called as a result of using ineffective language in oral communication? **L1/CO1**
a. Misunderstanding
b. Understanding
c. Peace
d. Praise

xii) By ..... the barriers to communication can be overcome. **L1/CO1**
a. using simple language
b. active listening
c. asking clarifying questions
d. All of the above

Q. 2) Solve the following:

A) Explain the cycle of communication. **L2/CO1**

B) Assume your friend tells you that he/she is good at English but gets afraid to speak with others; against this backdrop, how will you help him/her to make the communication effective? **L3/CO2**

Q. 3) Solve the following:

A) Explain in your own words the DOs and DON'Ts of group **L2/CO1**

discussion.

B) Suppose you have been selected as an engineer in an MNC and you are called on for the interview next week; how will you get prepared for this interview? L3/CO2 6

Q. 4) Solve any TWO of the following: 12

A) i) Transcribe the following in phonemic symbols: L1/CO2 6

Language, University, Paper.

ii) Spell the following:

/iŋgliʃ/, /pen/, /dɪkʃənəri/

B) Draw a figure of human mouth and mention any six organs of speech. L1/CO2 6

C) How does the process of intonation play a vital role in an effective communication? L1/CO2 6

Q. 5) Solve any TWO of the following: 12

A) Do as directed: L1/CO2 6

i) Everyone should knows his / her responsibilities. (Find the error and rewrite the sentence)

ii) He was complete the B Tech degree before 10 years. (find the common error and rewrite the sentence)

iii) University is a place where the applicable knowledge is served to the pupils. (Rewrite using simple past tense)

iv) You are strictly restricted from standing beside the bridge. (Rewrite using appropriate modal auxiliary)

v) The doctor said that I need to do the exercise regularly. (Rewrite using appropriate modal auxiliary)

vi) Language has been one of the mediums of communication. (Rewrite using simple present tense)

B) Fill in the blanks: L1/CO2 6

i) I am reading …… interesting article on Indian literature. (a, an, the)

ii) …….. sun rises in the east. (a, an, the)

iii) ……. United States is a country in North America. (a, an, the)

8×4 = 32

iv) I am looking forward ..... seeing you tomorrow. (to, in, for)

v) The meeting will take place ..... the conference room. (in, on, at)

vi) The city is located ..... the coast. (in, on, between)

C) Do as directed: L1/CO2 6

i) Suggest synonyms for the following: Ignorance, Intelligent, Chauvinism

ii) Suggest antonyms for the following: Literacy, Sham, Peace

Q. 6) Solve any ONE of the following: 12

A) Write an application and compose a resume for the post of engineer in Mphasis Ltd., 65/2, Bagmane Parin, Bagmane Technology Park, A Block, C V Raman Nagar, Bangalore – 560093. (January 12, 2025) L3/CO5 12

B) i) Explain with examples the difference between formal writing and informal writing. L3/CO5 6

ii) Explain the difference between colonial style of writing and modern style of writing L3/CO5 6

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Winter Examination – 2024

Course: B. Tech | Branch: Common to all Branches | Semester: I

Subject Code & Name: 24AF1000ES106 & Programming for Problem Solving

Max Marks: 60 | Date:13/02/2025 | Duration: 3 Hr.

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

					(Level/CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**					12
1	Which generation of computers introduced the use of integrated circuits (ICs)?				Remember	1
	a. First Generation	b. Second Generation	c. Third Generation	d. Fourth Generation		
2	Which of the following is a primary function of an operating system?				Understand	1
	a. Word processing	Understand	c. Image editing	d. File encryption		
3	Which component acts as the brain of a computer system?				Understand	1
	a. Input device	b. Processor	c. Output device	d. Memory		
4	Which of the following is not a valid C data type?				Remember	1
	a. int	b. char	c. bool	d. string		
5	What is the output of the following expression in C? int x = 10, y = 5; printf ("%d", x > y && y < 10);				Apply	1
	a. 0	b. 1	c. 5	d. 10		
6	Which operator is used for bitwise AND operation in C?				Remember	1
	a. &&	b. &	c. |	d. ||		
7	What is the correct syntax for a do-while loop in C?				Understand	1
	a. do {...} while(condition);	b. do { ... } while(condition)	c. while(condition) { ... } do;	d. do { while(condition); }		
8	Which statement is used to exit a loop prematurely in C?				Remember	1
	a. exit	b. break	c. continue	d. return		

9	What will be the output of the following code?
	int x = 5;
	if (x == 5)
	printf("Hello");
	else
	printf("World");
					Apply	1

	a. Hello	b. World	c. HelloWorld	d. Compilation Error		
10	What is the index of the first element in a C array?				Remember	1
	a. 1	b. 0	c. -1	d. Depends on the		

				array		
11	What does the following pointer declaration mean? int *ptr;				Understand	1
	a. ptr is a pointer to an integer	b. ptr is an integer	c. ptr is a pointer to a float	d. None of the above		
12	Which of the following is used to write data to a file in C?				Understand	1
	a. fread	b. fwrite	c. fprintf	d. All of the above		
						12
Q. 2	**Solve the following.**					
A)	What are the steps involved in programming? Briefly describe each step.				Understanding	6
B)	What is the role of memory management in a computer system? Differentiate between primary and secondary memory.				Analyze	6
Q.3	**Solve the following.**					12
A)	What is operator precedence? Write an expression and explain how it is evaluated.				Understand & Apply	6
B)	Describe the conditional (ternary) operator and write a program to find the maximum of two numbers using it.				Understand & Apply	6
Q. 4	**Solve Any Two of the following.**					12
A)	Differentiate between while, for, and do-while loops with example programs.				Understand & Apply	6
B)	Write a c program to demonstrate the use of break and continue in loops.				Apply	6
C)	Describe the basics of user-defined functions and write a function to calculate the factorial of a number.				Understand & Apply	6
Q.5	**Solve Any Two of the following.**					12
A)	Explain the initialization of arrays in C with examples.				Understand & Apply	6
B)	Write a program to create and display a 3x3 matrix using a two-dimensional array in C.				Apply	6
C)	Write a c program to demonstrate the use of a pointer to an array.				Understand & Apply	6
Q. 6	**Solve Any Two of the following.**					12
A)	What is an array of structures? Write a c program to store and display details of 5 students.				Understand & Apply	6
B)	Discuss file opening and closing in c with examples of different modes.				Understand & Apply	6
C)	Write a c program to read and write data to a file using fprintf() and fscanf().				Understand & Apply	6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular/Supplementary Winter Examination – 2024

Course: B.Tech **Branch : Common To All Branches**

Semester : I

Subject Code & Name: BTES104 Computer Programming in C

Max Marks: 60 **Date:** 13/02/2025

Duration: 3 Hr.

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

					(Level/ CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**					**12**
1	What is the primary function of a compiler in programming?				CO1	1
	a. Execute the program	b. Convert source code to machine code	c. Debug the program	d. Write source code		
2	What does a flowchart primarily represent?				CO1	1
	a. Hardware connections	b. Algorithm or process flow	c. Database relationships	d. User interface design		
3	What is the output of the expression 5 % 2 in C?				CO2	1
	a. 0	b. 2	c. 1	d. 5		
4	What is the output of the expression 10 > 5 && 3 < 2?				CO2	1
	a. 0	b. 1	c. True	d. False		
5	Which statement allows skipping the current iteration of a loop and proceeding to the next?				CO3	1
	a. break	b. continue	c. exit	d. return		
6	Which loop ensures execution of the loop body at least once?				CO3	1

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	a. while	b. do-while	c. for	d. infinite loop		
7	How are arrays indexed in C?				CO4	1
	a. 0-based	b. 1-based	c. -1-based	d. Custom index		
8	What is the maximum number of elements in an array int arr[10][20];?				CO4	1
	a. 10	b. 20	c. 200	d. 100		
9	What does the increment operator (++) do?				CO2	1
	a. Multiplies a variable by 2	b. Increments a variable by 1	c. Adds 2 to a variable	d. Divides a variable by 2		
10	Which control flow statement is used for multi-way branching in C?				CO3	1
	a. if-else	b. switch	c. while	d. do-while		
11	Which keyword is used to define a structure in C?				CO5	1
	a. struct	b. class	c. object	d. record		
12	What is a pointer in C?				CO5	1
	a. A variable that stores the address of another variable	b. A variable that stores multiple values	c. A function returning integers	d. A structure type		
Q.2	**Solve the following.**					**12**
A)	Explain different phases in programming process.				CO1	**6**
B)	Draw the flowchart, write algorithm to check the given age is valid for voting.				CO1	**6**
Q.3	**Solve the following.**					**12**
A)	Write short notes on logical operators with examples.				CO2	**6**
B)	Explain the different Data types in C with suitable example.				CO2	**6**

Q. 4	**Solve Any Two of the following.**		**12**
A)	Write the syntax, flow chart and expain with example. i) for loop ii) while loop iii) do while	CO3	**6**
B)	Write a program in C to swap two numbers using a function.	CO3	**6**
C)	Write a program to check the given number is positive, negative or zero.	CO3	**6**
Q.5	**Solve Any Two of the following.**		**12**
A)	Write a program in C to read n number of values in an array and display them in reverse order.	CO4	**6**
B)	Write the any three built-in functions in string with description and syntax.	CO4	**6**
C)	Write a program in C to separate odd and even integers into separate arrays.	CO4	**6**
Q.6	**Solve Any Two of the following.**		**12**
A)	Explain structures with example.	CO5	**6**
B)	Differentiate between array and structure with suitable example.	CO5	**6**
C)	Write a C program to store a person's information(name, Empno and Salary) and display it on the screen using structure.	CO5	**6**
	***** End *****		

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Winter Examination – 2024

Course: B.Tech. Branch: Common To All Branches

Semester: I

Subject Code & Name: 24AF2EGRES104; Engineering Graphics

Max Marks: 60 Date: 11/02/2025 Duration: 4 Hr.

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

		(Level /CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**		**12**
1	Set squares are primarily used for drawing which angles? A) 30°, 45°, 60°, and 90° B) 15°, 35°, 75°, and 95° C) 10°, 20°, 50°, and 80° D) 25°, 50°, 70°, and 100°	(CO1)	1
2	What is the purpose of a center line in a drawing? A) To show visible outlines B) To represent symmetry and centers of circles C) To indicate section lines D) To show cutting planes	(CO1)	1
3	Which of the following is true for first-angle projection? A) The object is placed between the observer and the projection plane B) The projection plane is placed between the observer and the object C) Views are placed as they appear in reality D) It is the standard method in the United States	(CO2)	1
4	If a point is located on the XY plane in orthographic projection, which of the following is true? A) Its Z-coordinate is zero B) Its X-coordinate is zero C) Its Y-coordinate is zero D) It is in the first quadrant	(CO2)	1
5	The true length of a line is seen in which of the following conditions? A) When the line is parallel to the plane B) When the line is perpendicular to the plane C) When the line is inclined to both HP and VP D) When viewed from the side	(CO3)	1
6	If a line is located in the first quadrant and is inclined to HP, where will its front view be located? A) Above the XY line B) Below the XY line C) On the XY line D) At the origin	(CO 3)	1

12

7 A pentagonal plane resting on HP with an edge inclined to VP will have its top view appearing as: (CO 4)

A) A pentagon
B) A horizontal line
C) A distorted pentagon
D) A vertical line

8 If a plane is inclined to both HP and VP, its projections appear as: (CO 4)

A) A true shape in both views
B) A point in both views
C) Inclined lines in both views
D) A horizontal and vertical line

9 When a prism is lying on HP with its axis inclined to HP, its front view will be: (CO 4)

A) A rectangle
B) A parallelogram
C) A line
D) An ellipse

10 Which of the following is NOT a principal plane in orthographic projection? (CO 5)

A) Horizontal plane (HP)
B) Vertical plane (VP)
C) Side plane (SP)
D) Profile plane (PP)

11 The angles between the projection of the x-axis, y-axis, and z-axis in an isometric view are: (CO 5)

A) 90°
B) 120°
C) 45°
D) 60°

12 When a solid is cut by a plane, the shape of the section depends on: (CO 5)

A) The position of the plane
B) The material of the solid
C) The color of the solid
D) The surface texture of the solid

Q.2 Solve the following.

A) Draw the following lines by stating their description and general applications: (CO 1)

i. Continuous thick or Continuous wide
ii. Dashed thin (narrow)
iii. Chain thin Long-dashed dotted (narrow)

B) Differentiate Aligned and Uni-directional system of placing the dimensions on a drawing with the help of diagrams. (CO 2)

Q.3 Solve the following.

A) A line AB, 50 mm long, is inclined to the HP at 30° and parallel to the VP. The end nearest to the HP is 40 mm above it and 25 mm in front of the VP. Draw the projections. (CO 3)

B) A point P is in the first quadrant. Its shortest distance from the intersection point of H.P., V.P. and Auxiliary vertical plane, perpendicular to the H.P. and V.P. is 70 mm and it is equidistant from principal planes (H.P. and V.P.). Draw the projections of the point and determine its distance from the H.P. and V.P. (CO 2)

Q. 4 Solve Any Two of the following.

A) Draw the projections of a regular hexagon of 25 mm side, having one of its sides in the H.P. and inclined at 60° to the V.P., and its surface making an angle of 45° with the H.P. (CO 4)

B) A square pyramid of side of base 40 mm and length of axis 60 mm is resting on its corner of base on ground with an edge of the base through that corner making an angle of 60° with the HP. The apex is away from the observer and the axis is parallel to the HP. Draw the projections if the axis is inclined to the VP at 20°. (CO 4) 6

C) A cone of diameter 60 mm and height 60 mm is resting on the HP on one of its generators. Draw its projections if its axis is parallel to the VP. (CO 4) 6

Q.5 Solve Any Two of the following. 12

A) A pentagonal pyramid having a base side of 45 mm and a slant length of 80 mm rests on its base on the HP with a base edge AB perpendicular to the VP. A section plane passing through corner D and perpendicular to the slant face ABO cuts the solid. Draw FV and sectional TV. (CO 5) 6

B) A cylinder of 40 mm diameter, 60 mm height and having its axis vertical, is cut by a section plane, perpendicular to the V.P., inclined at 45° to the H.P. and intersecting the axis 32 mm above the base. Draw its front view, sectional top view, sectional side view and true shape of the section (CO 5) 6

C) Draw the development of the lateral surface of the part P of the triangular pyramid as shown in Fig. 1. The line o'1' in the front view is the true length of the slant edge because it is parallel to xy in the lop view. The true length of the side of the base is seen in the top view. (CO 6) 6

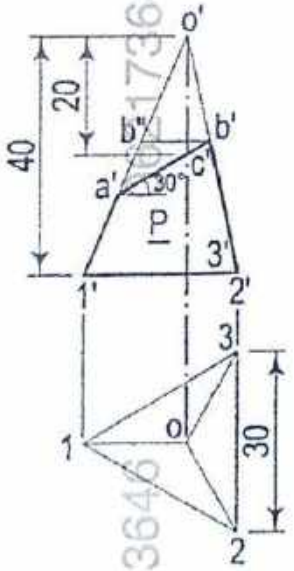


Fig. 1

Q. 6 Solve Any Two of the following. 12

A) Draw the FV and TV of the object shown in Fig. 2 using the third-angle method. (CO 5) 6

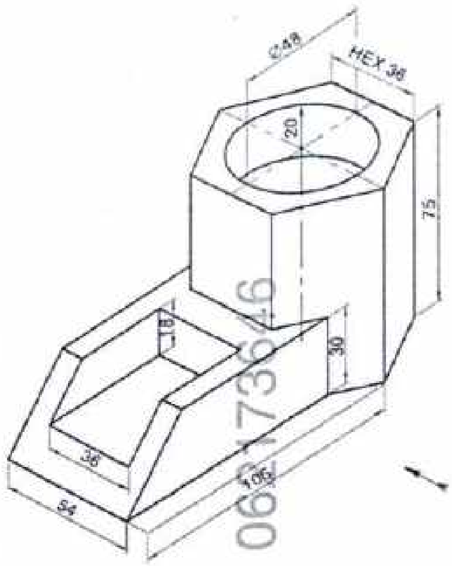


Fig. 2

B) Draw the half-sectional FV, and half-sectional RHSV of the object as shown in Fig.3 by using first angle method. (CO 5)

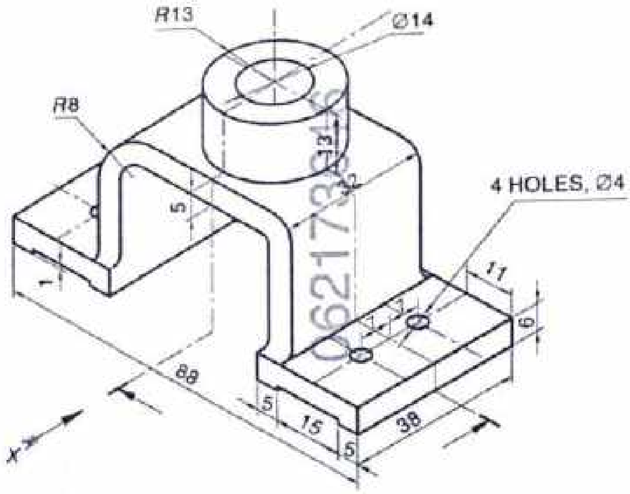


Fig. 3

C) Fig. 4 shows the FV and LHSV of an object. Draw its isometric view. (CO 5)

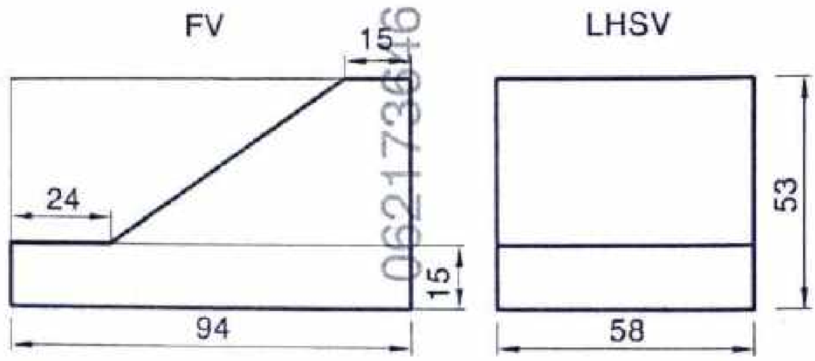


Fig. 4

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular/Supplementary Winter Examination – 2024

Course: F.Y.B.Tech. Branch :Common to all Branches Semester : I

Subject Code & Name: BTES103G Engineering Graphics

Max Marks: 60 Date:11/02/2025 Duration: 4 Hr.

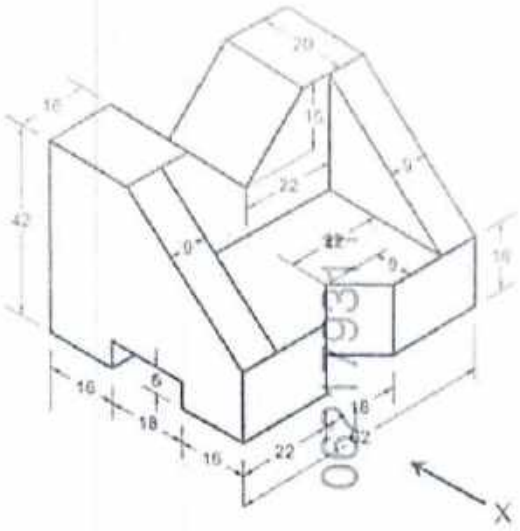
Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

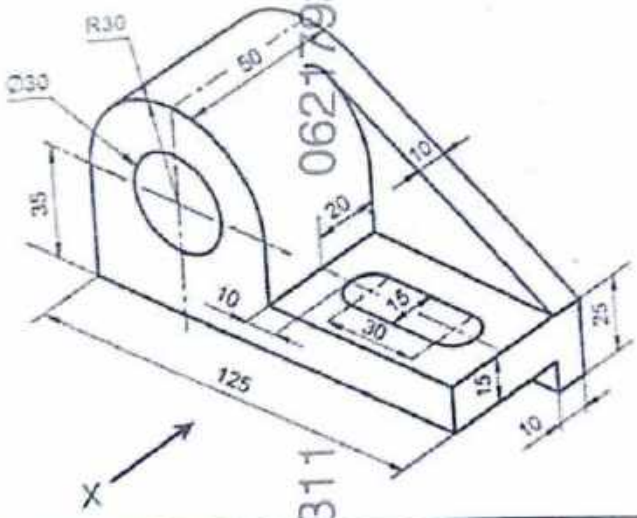
					(Level/CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**					**12**
1	The polygon having eleven sides is called -------				CO-I	1
	a). Nonagon	b) Decagon	c) Un decagon	d) Dodecagon		
2	The following line is used for dimension line				CO-I	1
	a) Continuous thick	b) Continuous thin	c) Chain thin line	d) Short zigzag thin line		
3	If object is in third quadrant it will be ----				CO-II	1
	a) Below HP & behind VP	b) In front of VP & above HP	c) Above HP & behind VP	d) Below HP & In front of VP		
4	If point P is , in front of VP & below HP , is in ----------				CO-II	1
	a) First quadrant	b) Second quadrant	c) Third quadrant	d) Fourth quadrant		
5	If projectors are parallel to each other & perpendicular to reference plane is called				CO-III	1
	a) Orthographic projection	b) Isometric projection	c) Oblique projection	d) Perspective projection		
6	In Orthographic projection , Side view is projected on				CO-III	1
	a) vertical plane	b) Horizontal plane	c) Profile plane	d) Auxiliary plane		
7	When a point is above HP & in front of VP, the point is in Which quadrant ?				CO-II	1

14

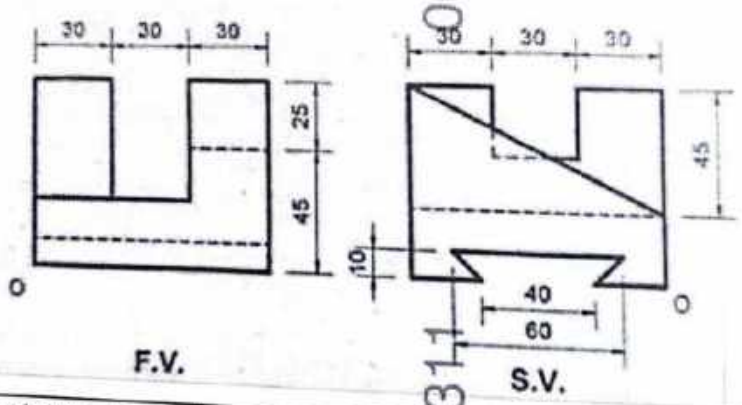
	a.First	b. Second	c. Third	d. Fourth		
8	The length of F.V. and T.V. of the line, when line is inclined to both the plane are -----than the true length. (T.L.) of the line.				CO-III	1
	a) Less	b) Greater	c) Equal	d) Two times greater		
9	If circular lamina is equally made inclined to both principal planes , its plan and elevation seen as ---------				CO-IV	1
	a) Circle	b) Square	c) Ellipse	d) Rhombus		
10	Name the regular polyhedron that is formed with four equilateral triangles.				Co-IV	1
	a) Tetrahedron	b) Triangular pyramid	c) Dodecahedron	d) Icosahedrons		
11	The trace of a section plane is				CO-V	1
	a) a curve	b) a straight line	c) a circle	d) a rectangle		
12	The Rectangular axes are inclined at ------ degree to each other.				CO-V	1
	a) 60	b) 90	c) 120	d) 150		
Q.2	Solve the following.					12
A)	Draw the regular pentagon of 30 mm side, use any accurate method.				CO-I	6
B)	What is dimensioning? explain methods of dimensioning with neat sketch.				CO-I	6
Q.3	Solve, any one of the following.					12
A)	Draw the front view in X- direction, Top view and side view of the following sketch by angle Method of Projection.				CO-II	12



B)	OR Figure shows, an isometric view, looking in X direction, draw 1. Elevation 2. Plan 3. Visible End View	CO-II	12



Q.4	Solve Any Two of the following.		12
A)	A straight line , 90 mm long , one end ,is 20 mm above HP and 25 mm in front of VP. The line is inclined at 25 degree to HP and 40 degree to VP. Draw projection .	CO-III	6
B)	A hexagonal lamina , 30 mm side , one corner is resting in VP and the diagonal is passing through , resting corner is parallel to HP and 45 degrees inclined to VP. Draw three views.	CO-III	6

C)	A pentagonal plate , 30 mm side , one side is in HRP . The surface of plate is made inclined by 45 degrees to HRP and perpendicular to VP draw three views.	CO-III	6
Q.5	Solve Any Two of the following.		12
A)	A hexagonal pyramid , base 30 mm side and length of axis , 60 mm , one corner of the base is in HP. The axis of pyramid is parallel to VP and 45 degrees inclined to HP. Draw Projection.	CO-IV	6
B)	A right circular cone , base 50 mm diameter and length of axis 70 mm, the axis of cone is inclined by 45 degrees to HRP and parallel to FRP. Draw projection.	CO-IV	6
C)	A square pyramid , base 30 mm side and 60 mm height , all base edges are equally inclined with FRP. It is cut by A.I.P., inclined at 45 degree to HRP and perpendicular to FRP. The cutting plane is bisecting the axis. Draw sectional top view and true shape of a section.	CO-V	6
Q.6	Solve Any One of the following.		12
A)	Figure shows , two orthographic views of an object , take O as a origin and draw isometric view. 	CO-V	12
B)	Figure shows , two orthographic views of an object , take O as a origin and draw isometric view.	CO-V	12

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2024

Course: B. Tech | **Branch: Common To All Branches** | **Semester: I**

Subject Code & Name: BTES103 & Engineering Mechanics

Max Marks: 60 | **Date:** 11/02/2025 | **Duration: 3 Hr.**

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *The level of question/expected answer as per OBE of the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

		(Level /CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**		**12**
1	A force system consists of: a) A single force acting on a body b) Two or more forces acting simultaneously on a body c) Only external forces d) Only internal forces	L1	1
2	Which of the following best represents the equilibrium condition for forces in two dimensions? a) $\Sigma Fx = 0, \Sigma Fy = 0, \Sigma Mz = 0$ b) $\Sigma Fx \neq 0, \Sigma Fy = 0, \Sigma Mz = 0$ c) $\Sigma Fx = 0, \Sigma Fy \neq 0, \Sigma Mz = 0$ d) $\Sigma Fx = 0, \Sigma Fy = 0, \Sigma Mx = 0$	L1	1
3	When two or more forces acting at a point are combined into a single force, it is called: a) Equilibrant b) Resultant force c) Couple d) Load factor	L1	1
4	The analytical conditions for equilibrium in two-dimensional force systems are: a) $\Sigma Fx = 0$ and $\Sigma Fy = 0$ b) $\Sigma Fx = 0, \Sigma Fy = 0$, and $\Sigma Mz = 0$ c) $\Sigma Fx \neq 0, \Sigma Fy = 0$ d) $\Sigma Mx = 0, \Sigma My = 0$	L1	1
5	In a force system in equilibrium, the sum of horizontal forces must be: a) Greater than vertical forces b) Equal to the sum of moments c) Equal to zero d) Less than vertical forces	L1	1
6	The force polygon method is used to: a) Find the equilibrium of parallel forces b) Determine the resultant force graphically c) Solve problems involving moments d) Find the center of gravity	L1	1

7 The equation used to determine if a truss is perfect: L1

a) m+4=2j b) m=2j−3

c) 2m=3+j d) m=j+r

8 When a body is just about to move, the frictional force acting on it is called: L1

a) Sliding friction b) Rolling friction

c) Limiting friction d) Dynamic friction

9 The slope of a velocity-time graph represents: L1

a) Displacement b) Acceleration

c) Velocity d) Force

10 When an object falls freely under gravity, its acceleration is: L1

a) Variable b) Zero

c) Constant and downward d) Constant and upward

11 According to D'Alembert's principle, the equation of motion can be written as: L1

a) F−ma=0 b) F+ma=0

c) F=ma d) F=m/v

12 The kinetic energy of a moving object depends on: L1

a) Velocity and mass b) Acceleration and mass

c) Force and displacement d) Work and power

Q. 2 Solve the following. 1

A) State triangle law of forces and polygon law of forces. State and prove parallelogram law of forces. L2 6

B) What are various type of loadings? Distinguish clearly between uniformly distributed load, uniformly varying load and triangular load. L2 6

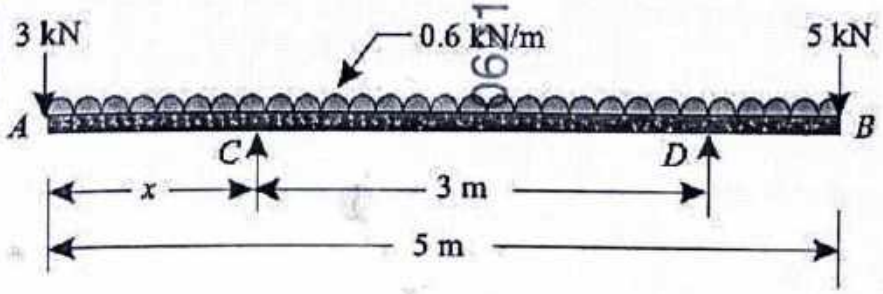
Q.3 Solve the following. 1

A) An I-section has the following dimensions in mm units : L3 6

Bottom flange = 300 × 100, Top flange = 150 × 50, Web = 300 × 50

Determine mathematically the position of centroid of the section. Take bottom of the bottom flange as the axis of reference.

B) A beam AB 5 m long, supported on two intermediate supports 3 m apart, carries a uniformly distributed load of 0.6 kN/m. The beam also carries two concentrated loads of 3 kN at left hand end A, and 5 kN at the right hand end B. Determine the location of the two supports, so that both reactions are equal. L2 6

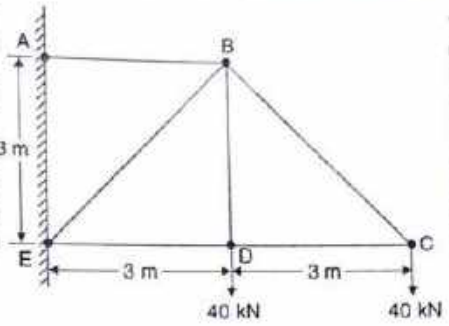


Q. 4 **Solve Any Two of the following.** **12**

A) Explain angle of friction, angle of repose and cone of friction with diagrams. L2 6

B) A body, resting on a rough horizontal plane, required a pull of 180 N inclined at 30° to the plane just to move it. It was found that a push of 220 N inclined at 30° to the plane just moved the body. Determine the weight of the body and the coefficient of friction. L3 6

C) Find the forces in all the members of the truss shown in figure. Tabulate the results. L2 6

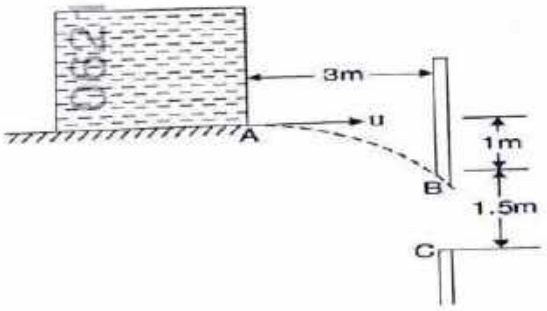


Q.5 **Solve Any Two of the following.** **12**

A) A stone dropped into a well is heard to strike the water in 4 seconds. Find the depth of the well, assuming the velocity of sound to be 335 m/sec. L2 6

B) Two ships leave a port at the same time. The first steams North-West at 32 kilometres per hour and the second 40° West to south at 24 kilometres per hour. L3 6
(a) What is the velocity of the second ship relative to the first in km per hour?
(b) After what time, they will be 160 km apart?

C) A pressure tank issues water at A with a horizontal velocity u as shown in figure. For what range of values of u, water will enter the opening BC. L2 6



Q. 6 **Solve Any Two of the following.** **12**

A) Describe a concept of mass moment of inertia. L2 6

B) A vehicle, of mass 500 kg, is moving with a velocity of 25 m/s. A force of 200 N acts on it for 2 minutes. Find the velocity of the vehicle: L2 6
(1) when the force acts in the direction of motion, and
(2) when the force acts in the opposite direction of the motion.

C) State and prove work energy principle. L3 6

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2024

Course: F. Y. B. Tech. **Branch :** All branches

Semester :I Branch: Common to all branches

Subject Code & Name: BTBS 102/202 (Engineering Chemistry)

Max Marks: 60 **Date:** 08/02/2025 **Duration:** 3 Hr.

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

					(Level/CO)	Marks
Q. 1	**Objective type questions. (Compulsory Questions)**					**12**
1	Ca-EDTA is a---------- complex.				1	1
	a. blue colour	b. colourless	c. red colour	d. pink colour		
2	The unit of Hardness is ----------				1	1
	a. ppm	b. Nm	c. mhos	d. ohm		
3	The water which produce lather with soap is called ---------- water				1	1
	a. Hard	b. Soft	c. bleached	d. salty		
4	Sulphur system is a ---------- component system.				2	1
	a. three	b. two	c. One	d. zero		
5	Along vapour pressure curve of water system.....phases are in equilibrium.				2	1
	a. solid-liquid	b. liquid-vapour	c. vapour -solid	d. liquid-liquid		
6	----------phase rule is applicable for Ag-Pb alloy system.				2	1
	a. Expanded	b. Normal	c. Ohms	d. Condensed		
7	Calorific value of Peat coal is ----------				4	1
	a. 5400	b. 1500	c. 250	d. 8000		
8	Pitting corrosion is ---------- type of corrosion.				3	1
	a. localised	b. delocalised	c. wet	d. Dry		
9	----------corrosion occurs due to the action of microbs.				3	1
	a. pitting	b. Microbial	c. Galvanic	d. wet		
10	Which of the following is an example of Solid Lubricant?				4	1
	a Talc	b. Petrol	c. Diesel	d. None		

11	Phenolphthalein is a weak ---------- acid.				5	1
	a. Inorganic	b. Organic	c. neutral	d. chemical		
12	Glass electrode is used to measure ----------				5	1
	a. resistance	b. conductance	c. electricity	d. pH		
Q.2	**Solve the following.**					12
A)	What is Dissolve Oxygen ? How it can be determined by Winkler's Method				1	6
B)	Discuss in brief disadvantages of hard water in Domestic and Industrial use.				1	6
Q.3	**Solve the following.**					12
A)	Explain the terms Phase and Component with suitable examples in Phase Rule equation.				2	6
B)	Explain in detail one component phase diagram of Water system				2	6
Q. 4	**Solve Any Two of the following.**					12
A)	Explain methods to minimize the rate of corrosion.				3	6
B)	Discuss Direct or Dry chemical corrosion.				3	6
C)	Write a note on : Sacrificial anodic protection method.				3	6
Q.5	**Solve Any Two of the following.**					12
A)	Discuss different types of Coal with its characteristics and uses.				4	6
B)	Explain in detail Physical and chemical properties of Lubricants.				4	6
C)	Write a note on proximate analysis of coal.				4	6
Q.6	**Solve Any Two of the following.**					12
A)	Explain the principal of Conductometric titration with example of a) Strong acid and Strong base b) Weak acid and Strong base.				5	6
B)	Discuss the determination of conductance by Wheatstone's bridge.				5	6
C)	Write a note on Glass electrode.				5	6
	*** End ***					

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Winter Examination – 2024

Course: F. Y. B. Tech **Branch:** Common To All Branches **Semester:** I

Subject Code & Name: 24AF2PHYBS102, Engineering Physics

Max Marks: 60 **Date:** 08/02/2025 **Duration:** 3 Hr.

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

					(Level/CO)	Marks
Q. 1	**Objective type questions. (Compulsory Question)**					**12**
1	The speed of propagation of ultrasonic waves increases with increase in				Remember (CO1)	1
	a. Wavelength	b. Frequency	c. Amplitude	d. Intensity		
2	Dielectric materials are generally				Remember (CO1)	1
	a. Insulating Materials	b. Ferri Electric Materials	c. Ferro Electric Materials	d. Superconducting Materials		
3	In Newton's ring shape of interference pattern is				Remember (CO2)	1
	a. Straight fringes	b Circular fringes	c. Elliptical fringes.	d. Straight & Equidistant lines		
4	The substance which rotates the plane of polarization to left is called as				Remember (CO2)	1
	Dextrorotatory	b. Levorotatory	c. Oscillatory	d. None of these		
5	The principle of Laser is				Remember (CO2)	1
	a. Spontaneous emission	b. Stimulated emission	c. Thermionic emission	d. All of these		
6	Numerical aperture is also called as _____ of the fiber				Remember (CO2)	1
	a. Reflecting angle	b. Sine of Acceptance angle	c. Scattering angle	d. Recoiling angle		
7	According to Heisenberg's principle, certainty in position involves				Remember (CO3)	1
	a. Uncertainty in momentum	b. certainty in momentum	c. uncertainty in position	d. certainty in position		
8	What is the fundamental unit of information in quantum computing				Remember	1

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	a. Bit	b. Qubit	c. Byte	d. Quantum Byte	(CO3)
9	Geiger Muller Counter is used to measure				Remember (CO4)
	a. α particles	b. β and Υ particles	c. α, β & Υ particles	d. None of these	
10	Number of atoms per unit cell for Face centered Cubic structure is				Remember (CO4)
	a.1	b. 4	c. 2	d. 6	
11	The temperature at which normal material turns into superconductor is				Remember (CO5)
	a. Absolute Temperature	b. Critical Temperature	c. Mean Temperature	d. Crystallization Temperature	
12	1 Nanometer=_____m				Remember (CO5)
	a. 10^{9}	b. 10^{-10}	c. 10^{-9}	d. 10^{10}	
Q. 2	**Solve the following.**				
A)	What is Piezoelectric effect? Describe the production of ultrasonic waves by using Piezoelectric method.				Remember/ Understand (CO1)
B)	Explain any three factors affecting architectural acoustics of a building. A cinema hall has a volume of 7500 m^3 . It is required to have reverberation time of 1.5 sec. What should be the total absorption in the hall?				Understand (CO1)
Q.3	**Solve the following.**				
A)	Derive an expression for diameter of n^{th} bright and dark Newton's rings.				Understand (CO2)
B)	Explain the construction and working of Helium Neon laser.				Understand (CO2)
Q. 4	**Solve Any Two of the following.**				
A)	What is Heisenberg's uncertainty principle? If the uncertainty in position of an electron is $4X10^{-10}$m. Calculate the uncertainty in its momentum.				Remember/ Understand (CO3)
B)	Derive time independent Schrodinger wave equation.				Understand (CO3)

C)	Derive time dependent Schrodinger wave equation.	Understand (CO3)	6
Q.5	**Solve Any Two of the following.**		12
A)	Define atomic packing fraction. Calculate the atomic packing fraction in SC, BCC, FCC lattices.	Remember/ Understand (CO4)	6
B)	Derive the relation between lattice parameter 'a' and crystal density 'ρ' Copper has FCC structure and its atomic radius is 1.278 A^0. Calculate density of Cu. Given atomic weight of Cu=63.5.	Understand (CO4)	6
C)	With neat diagram explain the construction & working of Geiger Muller Counter.	Understand (CO4)	6
Q. 6	**Solve Any Two of the following.**		12
A)	Explain the B-H curve for ferromagnetic materials. Define Coercivity and retentivity	Understand (CO5)	6
B)	Define superconductivity and distinguish between Type I & Type II superconductors.	Understand (CO5)	6
C)	What is nanomaterial? Explain top-down and bottom-up approach for synthesis of nanomaterial	Understand (CO5)	6
	*** End ***		

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Winter Examination – 2024

Course: B. Tech. **Branch: Common to all branches** **Semester: I**

Subject Code & Name: (24AF1000BS101) Engineering Mathematics - I

Max Marks: 60 **Date: 06/02/2025** **Duration: 3 Hr.**

Instructions to the Students:

1. *Each question carries 12 marks.*
2. *Question No. 1 will be compulsory and include objective-type questions.*
3. *Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.*
4. *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.*
5. *Use of non-programmable scientific calculators is allowed.*
6. *Assume suitable data wherever necessary and mention it clearly.*

					(CO)	Marks
Q.1	**Objective type questions. (Compulsory Question)**					**12**
1	Homogeneous system of linear equations is/has				(CO1)	1
	a. always consistent	b. always inconsistent	c. no solution	d. None		
2	The rank of matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ 3 & 3 & 3 \end{bmatrix}$ is equal to				(CO1)	1
	a. 1	b. 2	c. 3	d. None		
3	If $A = [a_{ij}]$ is a square matrix of order n, then trace of matrix A is				(CO1)	1
	a. product of diagonal elements	b. sum of diagonal elements	c. sum of row elements	d. None		
4	If $u = f\left(\frac{y}{x}\right)$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$ is equal to				(CO2)	1
	a. $2u$	b. u	c. 0	d. None		
5	If $u = x^y$ then $\frac{\partial u}{\partial y}$ is equal to				(CO2)	1
	a. $x^y \log x$	b. 0	c. yx^{y-1}	d. None		
6	If $u = f(y-z, z-x, x-y)$ show that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z}$				(CO3)	1
	a. 1	b. 0	c. -1	d. None		
7	The condition for the function $f(x,y)$ to have maximum value at (a, b) is				(CO3)	1
	a. $rt - s^2 > 0$ and $r < 0$	b. $rt - s^2 > 0$ and $r > 0$	c. $rt - s^2 < 0$ and $r < 0$	d. None		
8	If $x = uv, y = \frac{u}{v}$ then $\frac{\partial(x,y)}{\partial(u,v)}$ is				(CO3)	1
	a. $\frac{-2u}{v}$	b. $\frac{-2v}{u}$	c. 0	d. None		
9	The formula for $\int_0^{\frac{\pi}{2}} \sin^n\theta d\theta$ is equal to				(CO4)	1
	a. $\frac{n(n-1)(n-3)\ldots\ldots}{n(n-2)(n-4)\ldots\ldots} \times \frac{\pi}{2}$	b. $\frac{n(n-1)(n-3)\ldots\ldots}{n(n-2)(n-4)\ldots\ldots} \times 1$	c. $\frac{n(n-1)(n-3)\ldots\ldots}{n(n-2)(n-4)\ldots\ldots} \times 1$ or $\frac{\pi}{2}$	d. None		

10	The number of loops in the polar curve $r = a\sin 2\theta$ are				(CO4)	1
	a. 4	b. 2	c. 6	d. None		
11	The value of $\int_0^2 \int_1^y xy\,dxdy$ is equal to				(CO5)	1
	a. 0	b. 1	c. -1	d. None		
12	In polar co-ordinate system (r, θ) ; value of $dy\,dx$ is equal to				(CO5)	1
	a. $dr\,d\theta$	b. $rdr\,d\theta$	c. $r^2 dr\,d\theta$	d. None		
Q.2	**Solve the following.**					12
A)	Solve the equations: $x + 3y + 2z = 0;\ 2x - y + 3z = 0;\ 3x - 5y + 4z = 0.$				(CO1)	6
B)	Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 1 & 0 & -4 \\ 0 & 5 & 4 \\ -4 & 4 & 3 \end{bmatrix}$				(CO1)	6
Q.3	**Solve the following.**					12
A)	If $x^x y^y z^z = c$, show that at $x = y = z$, $\frac{\partial^2 z}{\partial x \partial y} = -(x \log ex)^{-1}$.				(CO2)	6
B)	If z is a homogeneous function of degree n in x, y, then prove that $x^2 \frac{\partial^2 z}{\partial x^2} + 2xy \frac{\partial^2 z}{\partial x \partial y} + y^2 \frac{\partial^2 z}{\partial y^2} = n(n-1)z.$				(CO2)	6
Q.4	**Solve any TWO of the following.**					12
A)	Expand $f(x, y) = e^x \sin y$ in the powers of x and y as far as the terms of third degree.				(CO3)	6
B)	Test the function $f(x, y) = x^4 + y^4 - x^2 - y^2 + 1$ for maxima, minima and saddle point				(CO3)	6
C)	Find the maximum value of $x^m y^n z^p$ when $x + y + z = a$.				(CO3)	6
Q.5	**Solve any TWO of the following.**					12
A)	Evaluate $\int_0^\infty \frac{dx}{(1+x^2)^8}$.				(CO4)	6
B)	Trace the curve $x = a(\theta - \sin\theta),\ y = a(1 - \cos\theta)$ (Cycloid).				(CO4)	6
C)	Trace the curve $r = a \sin 3\theta$ (3 Leaved Rose).				(CO4)	6
Q.6	**Solve any TWO of the following.**					12
A)	Evaluate $\int_1^2 \int_0^x e^{x+y}\,dy\,dx$.				(CO5)	6
B)	Find the area of the circle $x^2 + y^2 = a^2$.				(CO5)	6
C)	Define and verify Cayley Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 0 & 1 \\ 2 & 1 & -1 \end{bmatrix}$				(CO2)	6
	*** End ***					