

Hall Ticket Number :									
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R-19

Code: 19A35ET

III B.Tech. I Semester Regular Examinations February 2022

Automobile Engineering
(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks	CO	Blooms Level
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UNIT-I

- | | | | | |
|-------|---|----|-----|----|
| 1. a) | With the help of neat sketches, describe (i) Cylinder Block and (ii) Crank Case | 7M | CO1 | L2 |
| b) | Explain the working of a centrifugal type oil filter with a neat diagram. | 7M | CO1 | L2 |

OR

- | | | | | |
|-------|---|----|-----|----|
| 2. a) | What is the necessity of generator output control? Discuss various methods of achieving the same. | 7M | CO1 | L2 |
| b) | Explain with neat sketch of horn and Engine temperature indicator. | 7M | CO1 | L1 |

UNIT-II

- | | | | | |
|-------|---|----|-----|----|
| 3. a) | Explain the construction and working of a catalytic converter with a neat sketch. | 7M | CO2 | L2 |
| b) | What are the advantages and disadvantages of the catalytic converter method? | 7M | CO2 | L2 |

OR

- | | | | | |
|----|---|-----|-----|----|
| 4. | Describe the method of exhaust gas recirculation with a neat sketch? How it will help to reduce the pollution from an automobile. | 14M | CO2 | L2 |
|----|---|-----|-----|----|

UNIT-III

- | | | | | |
|-------|--|-----|-----|----|
| 5. a) | What is the principle of clutch and its classification. | 4M | CO3 | L3 |
| b) | Describe the working of a synchromesh gear box with the help of a neat sketch. What are its merits and demerits compared to sliding mesh gear box? | 10M | CO3 | L2 |

OR

- | | | | | |
|-------|---|----|-----|----|
| 6. a) | Explain with the help of a neat sketch, the construction of a propeller shaft in an automobile. | 7M | CO3 | L2 |
| b) | Discuss in detail any two different methods of supporting rear axle shafts with neat sketches. | 7M | CO3 | L2 |

UNIT-IV

7. a) Write short notes on:
 (i) Leaf springs,
 (ii) Torsion bar. 4M CO4 L1
- b) What is the purpose of independent suspension? Explain various methods to achieve the same in front and rear axles. Write its advantages and disadvantages. 10M CO4 L2

OR

8. Draw a simple diagram to show the layout of a hydraulically operated four wheel brake system and explain its working in detail. 14M CO4 L2

UNIT-V

9. a) What is ABS? What is its function? Explain when it needs to be activated in an automobile? 6M CO5 L2
- b) Explain the method of testing an ABS of an automobile. 8M CO5 L2
- OR
10. a) Write in detail the importance of seat belt devices in cars. Discuss the function of 3-point seat belt used in cars. 7M CO5 L2
- b) What is the function of anti-theft device in a car? How it works. 7M CO5 L2

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Hall Ticket Number :									
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R-19

Code: 19A351T

III B.Tech. I Semester Regular Examinations February 2022

Applied Thermodynamics – II

(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. a) What are thermodynamic variables effecting efficiency and output of Rankine cycle.	6M	CO2	L1
b) A steam power plant operates on a theoretical reheat cycle. Steam at boiler at 150 bar, 550°C expands through the high pressure turbine. It is reheated at the constant pressure of 40 bar to 550°C and expands through the low pressure turbine to a condenser at 0.1 bar. Draw T-S and H-S diagram. Find: i) Quality of steam at turbine exhaust. ii) Cycle efficiency iii) Steam rate in kg/kWh	8M	CO2	L4
OR			
2. a) Sketch and explain reheat cycle on Mollier chart	6M	CO2	L2
b) A steam turbine is supplied with dry saturated steam at 25 bar. The exhaust takes place at 0.2 bar. For a flow rate of 8 kg/s, calculate the (i) power required to drive the pump (ii) turbine power (iii) Rankine efficiency and quality of steam at the end of expansion	8M	CO2	L4
UNIT-II			
3. a) What are Boiler accessories? Explain any two in detail.	7M	CO2	L1
b) Sketch and explain the working of Lamont boiler	7M	CO2	L3
OR			
4. a) Give a broad classification of Boiler draught.	6M	CO2	L2
b) A boiler is having a chimney of height 35m. The draught produced in terms of water column is 20mm. The temperature of flue gases produced inside the chimney is 365°C and that of air outside the chimney is 35°C. Determine the mass of air used.	8M	CO2	L4
UNIT-III			
5. a) What is steam nozzle? Why it is convergent divergent? What assumptions are adopted in analyzing flow through nozzle	6M	CO2	L1
b) Dry saturated steam at a pressure of 8 bar enters a convergent-divergent nozzle and leaves it at a Pressure of 1.5 bar, if the flow is isentropic and the corresponding expansion index is 1.135, find the ratio of cross-sectional area at exit and throat for maximum discharge	8M	CO2	L4

OR

6. a) Define critical pressure ratio for the nozzle of the steam turbine. Obtain analytically its value in terms of the index of expansion. 6M CO2 L2
- b) Steam at 10 bar and 0.98 dry expands through a convergent divergent nozzle to a back pressure of 0.1 bar. The discharge through the nozzle is 0.55 kg/s. The enthalpy drop used for reheating the steam by friction in the divergent portion is 10% of the overall enthalpy drop. Determine (i) the throat pressure (ii) number of nozzles required if the throat area of each nozzle is 0.5 cm² (iii) exit diameter of each nozzle (iv) cone angle of divergent portion if its length is 10 cm. 8M CO2 L4

UNIT-IV

7. a) Compare the merits and demerits of surface condenser over jet Condenser. 6M CO2 L2
- b) In surface condenser the vacuum maintained is 700 mm of Hg. The barometer reads 754 mm. If the temperature of condensate is 18°C. Determine (i) mass of air per Kg of steam (ii) Vacuum Efficiency 8M CO2 L4

OR

8. a) Define the terms Vacuum efficiency and Condenser efficiency 6M CO2 L1
- b) Explain briefly the following types of jet condensers:
a) parallel-flow type b) counter flow type 8M CO2 L2

UNIT-V

9. a) Explain differences between impulse and reaction turbines. 6M CO2 L2
- b) In a reaction turbine, the blade tips are inclined at 35° and 20° in the direction of motion. The guides blades are of the same shape as the moving blades, but reversed in direction. At a certain place in the turbine, the drum diameter is 1 meter and the blades are 10cm high. At this place, the steam has a pressure of 1.75 bar and dryness 0.935. If the speed of this turbine is 250 rpm and the steam passes through the blades without shock, find the mass of steam flow and power developed in the ring of moving blades. 8M CO2 L4

OR

10. a) Explain with the help of neat sketch a single stage impulse turbine. Also explain the pressure and velocity variation along the axial direction. 6M CO2 L2
- b) In a simple impulse turbine the nozzles are inclined at 20° to the direction of motion of the moving blades. The steam leaves the nozzle at 375m/s. The blade velocity is 165m/s. Calculate suitable inlet and outlet angles for the blades in order that the axial thrust is zero. The relative velocity of steam as it flows over the blades is reduced by 15% by friction. Also determine the power developed for a flow rate of 10kg/s. 8M CO2 L4

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Hall Ticket Number :

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R-19

Code: 19A353T

III B.Tech. I Semester Regular Examinations February 2022

Design of Machine Elements-I

(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any *five full* questions by choosing one question from each unit (5 x 14 = 70Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. a) Explain the design procedure of machine elements.	8M	CO1	L2
b) Discuss the stress and strain relation. Draw a neat sketch of stress-strain Diagram and explain various stress points.	6M	CO1	L2
OR			
2. A cylindrical shaft made of steel of yield strength 700 MPa is subjected to static loads consisting of bending moment 10 kN-m and a torsional moment 30 kN-m. Determine the diameter of the shaft using two different theories of failure, and assuming a factor of safety of 2. Take $E = 210$ GPa and poisson's ratio = 0.25.	14M	CO2	L3
UNIT-II			
3. a) What are the principal causes of stress concentration? Explain with suitable sketches?	7M	CO2	L1,L2
b) Write Soderberg's equation and state its application to different type of loadings.	7M	CO2	L1
OR			
4. A machine member is made of plain carbon steel of ultimate strength 650 N/mm^2 and endurance limit of 300 N/mm^2 . The member is subjected to a fluctuating torsional moment which varies from -200 Nm to 400 Nm . Design the member using (i) modified Goodman's equation and (ii) Soderberg equation.	14M	CO2	L3
UNIT-III			
5. a) With neat sketches explain the various types of riveted joints.	7M	CO3	L3
b) Find the efficiency of the double riveted lap joint of 6mm thick plates with 20mm diameter rivets having a pitch of 65mm. Assume permissible tensile stress in plate= 120 MPa ; Permissible shearing stress in rivets= 90 MPa , permissible crushing stress in rivets= 180 MPa .	7M	CO3	L3

OR

6. a) What are the advantages and disadvantages of welded joints over riveted joints? 7M CO3 L3
- b) A plate 100 mm wide and 10 mm thick is to be welded to another plate by means of double parallel fillets. The plates are subjected to a static load of 80 kN. Find the length of weld if the permissible shear stress in the weld does not exceed 55 MPa. 7M CO3 L2

UNIT-IV

7. With simple sketch discuss the design procedure of Socket and spigot joint. 14M CO4 L3

OR

8. a) Design a knuckle joint to transmit 150 kN. The design stresses may be taken as 75 MPa in tension, 60 MPa in shear and 150 MPa in compression. 8M CO4 L1
- b) Draw neat sketches of different types of keys and state their applications. 6M CO4 L1

UNIT-V

9. a). Explain briefly a design of shafts subjected to combined bending and torsion. 7M CO5 L2
- b). A shaft is required to transmit 1 MW power at 240 rpm. The shaft must not twist more than 1° on a length of 15 diameters. If the modulus of rigidity for material of the shaft is 80 GPa, find the diameter of the shaft and shear stress induced. 7M CO5 L3

OR

10. Design a muff coupling which is used to connect two steel shafts transmitting 40 KW at 350 r.p.m. The material for the shafts and key is plain carbon steel for which allowable shear and crushing stresses may be taken as 40 MPa and 80 MPa respectively. The material for the muff is cast iron for which the allowable shear stress may be assumed as 15 MPa. 14M CO5 L3

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Hall Ticket Number :										
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R-19

Code: 19A35CT

III B.Tech. I Semester Regular Examinations Jan/Feb 2022

Industrial Management
(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks	CO	Blooms Level
-------	----	--------------

UNIT-I

- | | | | |
|---|----|-----|----|
| 1. a) Why is it so difficult to become an effective middle level manager? | 7M | Co1 | L3 |
| b) Explain about the various functions of management | 7M | Co1 | L1 |

OR

- | | | | |
|--|----|-----|----|
| 2. a) What do you understand by Departmentation and how can it be implemented? | 7M | Co1 | L1 |
| b) How do you strike balance between centralization and decentralization in a department under your control? | 7M | Co1 | L1 |

UNIT-II

- | | | | |
|--|-----|-----|----|
| 3. Define the concept 'plant layout 'and discuss factors influencing a layout. | 14M | Co2 | L1 |
|--|-----|-----|----|

OR

4. A company is planning to introduce a new product commercially The list of activities to be carried out with the corresponding duration of time in weeks is listed below.

Activity	Duration(weeks)	Immediate predecessor
A	3	-
B	11	A
C	9	A
D	2	C
E	5	B
F	6	C
G	2	D,E
H	11	F,G
I	8	B
J	9	H,I

Draw network diagram. Determine minimum project duration of the project.

14M	Co2	L1
-----	-----	----

UNIT-III

5. a) Define work study. Explain basic procedure of work study. 7M Co3 L1
 b) What are benefits do you derive from the work study? 7M Co3 L1

OR

6. a) What is 'work sampling' and what are its uses? 7M L1
 b) What do you understand by 'Predetermined Time motion system? Critically evaluate. 7M L3

UNIT-IV

7. Explain the various functions of a materials manager in a modern organization 14M Co4 L1

OR

8. a) What are the objectives of purchasing? 7M Co4 L1
 b) Discuss the basic principles of economic purchasing. 7M Co4 L3

UNIT-V

9. Briefly explain various wage incentives schemes? 7M Co5 L3
 Define merit rating. Discuss the objectives, advantages and disadvantages of merit rating 7M Co5 L1

OR

10. Write short notes on
 (a) Job description
 (b) Job rotation
 (c) Job enlargement
 (d) Job analysis. 14M Co5 L3

END

Code: 19A35JT

III B.Tech. I Semester Regular Examinations February 2022

Industrial Robotics
(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. a) Explain the working of the magnetic and vacuum cup grippers.	7M	CO1	L2
b) With a neat sketch explain the three degrees of freedom associated with the robot wrist.	7M	CO1	L3
OR			
2. a) Classify the industrial robots and briefly describe it.	7M	CO1	L2
b) Describe the major elements of an industrial robot.	7M	CO1	L3
UNIT-II			
3. A Cartesian co-ordinate robot is to move its three axis from position (x,y,z)=(0,5,5) to position (x,y,z)=(20,35,15). All the distances measures in cms. The maximum velocities for the three joints are, respectively, 20 cm/sec, 1cm/sec, and 10 cm/sec.			
i) Determine the time required to move each joint if skew motion is used			
ii) Determine the time required to move the arm and the velocity of each joint, if the joint interpolation is used.	14M	CO2	L3
OR			
4. a) Describe briefly the kinematics and dynamics of a robot.	7M	CO2	L2
b) What is meant by Inverse kinematics of robots?	7M	CO2	L3
UNIT-III			
5. a) Explain briefly about the following terms: (i) Skew Motion (ii) Path planning (iii) Joint Integrated motion.	8M	CO3	L2
b) Discuss straight line motion of robots.	6M	CO3	L3
OR			
6. a) What are the common types of motion that a robot manipulator can make in traveling from point to point? Explain.	7M	CO3	L2
b) Discuss steps involved in trajectory planning.	7M	CO3	L3
UNIT-IV			
7. a) Briefly explain the working principle of any two types of position sensors with a neat sketch.	7M	CO4	L2
b) Explain the working principle of Pneumatic actuators.	7M	CO4	L3
OR			
8. a) Classify encoders and explain any one velocity sensor.	7M	CO4	L2
b) Suggest some sensors which are used in industrial robot with respect to specific automobile assembly unit.	7M	CO4	L3
UNIT-V			
9. Explain modes of robot programming?	14M	CO5	L2
OR			
10. a) Discuss briefly about the robot inspection.	7M	CO5	L2
b) What are the features of the spray painting robot?	7M	CO5	L3

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Hall Ticket Number :

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R-19

Code: 19A352T

III B.Tech. I Semester Regular Examinations February 2022

Machine Tools

(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks CO Blooms Level

UNIT-I

- | | | | |
|---|----|---|----|
| 1. a) List out various tool materials and explain their applications. | 7M | 1 | L1 |
| b) Explain the use of chip breakers in metal cutting. | 7M | 1 | L2 |

OR

- | | | | |
|--|----|---|----|
| 2. a) Explain the geometry of chip formation with proper sketches. | 7M | 1 | L2 |
| b) Describe the following i) rake angle ii) Clearance angle iii) cutting angle iv) lip angle, with neat sketch | 7M | 1 | L2 |

UNIT-II

- | | | | |
|---|----|---|----|
| 3. a) Explain the principal features of automatic lathes. | 7M | 2 | L2 |
| b) Discuss about the thread turning attachment on lathe. | 7M | 2 | L2 |

OR

- | | | | |
|---|----|---|--------|
| 4. a) Define Taper. Discuss in detail the taper turning by compound rest swelling method? | 7M | 2 | L1, L2 |
| b) Differentiate between Capstan and turret lathes? | 7M | 2 | L2 |

UNIT-III

- | | | | |
|---|----|---|----|
| 5. a) Explain various operations performed in drilling machine. | 7M | 3 | L2 |
| b) Sketch hydraulic drive of a horizontal shaper. | 7M | 3 | L4 |

OR

- | | | | |
|--|----|---|----|
| 6. a) What are the different types of drill are used? Describe any one of the drill bits | 7M | 3 | L2 |
| b) Explain operations performed on vertical boring machine. | 7M | 3 | L2 |

UNIT-IV

- | | | | |
|--|----|---|----|
| 7. a) Classify the special types of grinding machines? Explain any two in detail | 7M | 4 | L2 |
| b) Explain centerless grinding with neat figure. | 7M | 4 | L2 |

OR

- | | | | |
|---|----|---|----|
| 8. a) Draw the broach tool and label the main parts on it. | 7M | 4 | L4 |
| b) List the advantages and limitation of centerless grinding. | 7M | 4 | L1 |

UNIT-V

- | | | | |
|--|----|---|----|
| 9. a) Differentiate between jigs and fixtures? | 7M | 5 | L2 |
| b) Explain how workpieces are located? | 7M | 5 | L2 |

OR

- | | | | |
|--|----|---|----|
| 10. a) Explain leaf jig with neat sketch? | 7M | 5 | L2 |
| b) List out the materials used in jigs and fixtures? | 7M | 5 | L1 |

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Hall Ticket Number :									
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R-19

Code: 19A35LT

III B.Tech. I Semester Regular Examinations February 2022

Rapid Prototyping
(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 14 = 70Marks)

Marks CO Blooms Level

UNIT-I

1. Explain generic RP process with neat sketch. Differentiate between Traditional Prototyping Vs. Rapid Prototyping. 14M CO1 BL1

OR

2. List and explain various Rapid Prototyping Data Formats? And also explain about the significance of STL format? 14M CO1 BL1

UNIT-II

3. With a neat sketch, explain the construction and operation of SGC technique and also list advantages and disadvantages of it. 14M CO2 BL2

OR

4. List the specifications of FDM machine. And also state the principle of operation and materials used in FDM technique. 14M CO2 BL1

UNIT-III

5. Briefly explain the principle and process details in Ballistic Particle Manufacturing (BPM) and its applications with neat sketch. 14M CO3 BL2

OR

6. What are the factors that influence the performance of the 3D printing process? Explain in detail. 14M CO3 BL2

UNIT-IV

7. Describe the following
i) Indirect soft and hard tooling.
ii) Direct soft and hard tooling. 14M CO4 BL3

OR

8. Distinguish between active and passive techniques in reverse engineering. How the 3D-photogram used in reverse engineering process? Explain with suitable example. 14M CO4 BL3

UNIT-V

9. List out the different errors occurs in RP processes. Explain Pre-Processing and Post-Processing Errors in RP Process. 14M CO5 BL2

OR

10. Explain the application of RP in
(i) Product development.
(ii) Medical Field. 14M CO5 BL3

END

*Choose the correct Answer.**100 X 1 = 100 Marks*

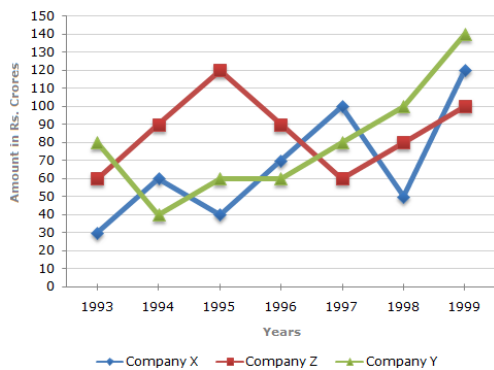
1. Two taps A and B can fill a tank in 4 hrs. and 5 hrs respectively. If both the pipes are opened simultaneously. How much time will be taken to fill the tank?
a) $2\frac{2}{9}$ hrs b) $3\frac{1}{2}$ c) $2\frac{1}{2}$ d) $5\frac{1}{2}$
2. A Certain number when divided by 95 leaves a remainder 30. What is the remainder if, the same number be divided by 19?
a) 8 b) 9 c) 10 d) 11
3. With what least number should 1250 be multiplied to make it a perfect cube?
a) 5 b) 10 c) 25 d) 100
4. Which three numbers in the ratio 3:2:5 have the sum of their squares as 1862?
a) 30, 20, 50 b) 21, 14, 35 c) 18, 21, 30 d) 24, 16, 40
5. Find the smallest number which when divided by 24, 36, & 60 leaves 20, 32, & 56 as remainders respectively?
a) 256 b) 356 c) 456 d) 556
6. If a merchant estimates his loss as 25% on the S.P, what is his actual loss %?
a) same b) 20% c) 15% d) 30%
7. The cost price of 4 articles is equal to the selling price of 5 articles. Find the profit or loss percentage.
a) 20% loss b) 25 % loss c) 25% profit d) 33.33% profit
8. On selling for Rs.600 a man loses 25%, at what price should it be sold to gain 25%?
a) 800 b) 900 c) 1000 d) 1200
9. One man and four boys can do a work in 26 days and two men and two boys can do the same work in 16 days. A man is how many times efficient than a boy?
a) 1.5 b) 4.6 c) 8 d) 12
10. 2 men can dig a 2 m canal in 2 days. Then 8 men can dig 8 m canal in how many days?
a) 1 b) 2 c) 4 d) 8
11. The average age of an adult class is 40 years. Twelve new students with an average age 32 years join the Class, thereby decreasing the average of the class by 4 years. The original strength of the class was
a) 10 b) 11 c) 12 d) 15
12. The Average of 13 results is 68. The average of first 7 is 63 and that of the last 7 is 70. What is the seventh result?
a) 27 b) 37 c) 47 d) 57
13. Anita can type a 3200 pages typing job in 10 days, while Beena can type 1600 pages in 5 days. If both work together, in how many days can they complete a 1920 pages typing job?
a) 3 b) 4 c) 5 d) 6
14. Pipe A can fill a tank in 6 hrs. Due to a leak in the bottom, it takes 8 hrs to fill the tank. If pipe A can fill the tank at the rate of 6 lts/minute, find the capacity of the tank.
a) 1080 b) 2160 c) 3200 d) 4210

15. The population of bacteria decreases by 20% every hour. If the population of the bacteria after one hour from now is calculated to be 1200, what would be its population before one hour from now?
 a) 1875 b) 1700 c) 1500 d) 1660
16. A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?
 a) 3.6 b) 7.2 c) 8.4 d) 10
17. Excluding stoppages the speed of a bus is 54 kmph and including stoppages it is 45 kmph. For how many minutes does the bus stop per hour?
 a) 9 b) 10 c) 12 d) 20
18. A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?
 a) 120 metres b) 180 metres c) 324 metres d) 150 metres
19. A group of friends goes for dinner and gets bill of Rs 2400. Two of them says that they have forgotten their purse so remaining make an extra contribution of Rs 100 to pay up the bill. Find the number of persons in that group?
 a) 8 persons b) 7 persons c) 6 persons d) 5 persons
20. There are seven books one each on Psychology, Hindi, English, Sociology, Economics, Education and Accountancy lying on the table one above the other. Sociology is on the top of all the books. Accountancy is immediate below Education which is immediately Sociology. Economics is immediately above Psychology but not in the middle. Hindi is immediately below Psychology. Which three books are between Accountancy and Hindi?
 a) Education, English, Economics b) Education, Economics, Psychology
 c) English, Economics, Psychology d) none of the above
21. If $6 \text{ and } 2 = 22$, $4 \text{ and } 3 = 1$, $8 \text{ and } 2 = 46$ then find the value of $7 \text{ and } 2$?
 a) 26 b) 33 c) 42 d) 45
22. Replace each letter by a digit from 1 to 9. Each letter represents the same digit whenever it occurs.
- $$\begin{array}{r} X X X X \\ Y Y Y Y \\ + Z Z Z Z \\ \hline Y X X X Z \end{array}$$
- What are the values for the alphabets X, Y and Z?
 a) X=2, Y=3, Z=5 b) X=3, Y=5, Z=7 c) X=7, Y=2, Z=5 d) X=9, Y=1, Z=8
23. Six girls P, Q, R, S, T and V are sitting in a circle facing to the center of the circle. Three queries are: T is not in between Q and S but some other one. P is next to the left of V. R is fourth to the right of P.
 Who is sitting just right to the V?
 a) P b) T c) R d) S/Q

DIRECTIONS FOR Q.No: (24 – 28)

Study the following line graph and answer the questions.

Exports from Three Companies Over the Years (in Rs. crore)



24. For which of the following pairs of years the total exports from the three Companies together are equal?
 a) 1995 and 1998 b) 1996 and 1998 c) 1977 and 1998 d) 1995 and 1996
25. Average annual exports during the given period for Company Y is approximately what percent of the average annual exports for Company Z?
 a) 87.12% b) 89.64% c) 91.21% d) 93.33%
26. What was the difference between the average exports of the three Companies in 1993 and the average exports in 1998?
 a) Rs. 15.33 crores b) Rs. 18.67 crores c) Rs. 20 crores d) Rs. 22.17 crores
27. In how many of the given years, were the exports from Company Z more than the average annual exports over the given years?
 a) 2 b) 3 c) 4 d) 5
28. In which year was the difference between the exports from Companies X and Y the minimum?
 a) 1994 b) 1995 c) 1996 d) 1997

DIRECTIONS FOR Q.No: (29 – 32): In each question below are given two statements followed by two conclusions numbered I and II. You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Read the conclusion and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts.

29. **Statements:** All the locks are keys.

All the keys are bats.

Some watches are bats.

Conclusions: 1. Some bats are locks. 2. Some watches are keys.

3. All the keys are locks.

- a) Only (1) and (2) b) Only (1)
 c) Only (2) d) Only (1) and (3)

30. **Statements:** Some keys are staplers.

Some staplers are stickers.

All the stickers are pens.

Conclusions: 1. Some pens are staplers. 2. Some stickers are keys.

3. No sticker is key.

4. Some staplers are keys.

- a) Only (1) and (2) b) Only (2) and (4)
 c) Only (2) and (3) d) Only (1) and (4) and either (2) or (3)

31. **Statements:** Some questions are answers.

Some answers are writers.

All the writers are poets.

Conclusions: 1. Some writers are answers. 2. Some poets are questions.

3. All the questions are poets.

4. Some poets are answers.

a) Only (1) and (2) b) Only (1) and (4) c) Only (1) and (3) d) Only (2) and (4)

32. **Statements:** Some envelopes are gums.

Some gums are seals.

Some seals are adhesives.

Conclusions: 1. Some envelopes are seals.

2. Some gums are adhesives.

3. Some adhesives are seals.

4. Some adhesives are gums.

a) Only (3) b) Only (1) c) Only (2) d) Only (4)

33. A+B means A is the son of B; A - B means A is the wife of B; A x B means A is the brother of B; A / B means A is the mother of B and A = B means A is the sister of B. Then what does P x R / Q mean?

a) P is the brother of R

b) P is the father of Q

c) P is the uncle of Q

d) P is the nephew of Q

34. 80, 10, 70, 15, 60, ... What number should come next?

a) 20

b) 25

c) 30

d) 50

35. 2, 6, 18, 54, ... What number should come next?

a) 108

b) 148

c) 162

d) 201

36. 5.2, 4.8, 4.4, 4, ... What number should come next?

a) 3.2

b) 3.6

c) 3.8

d) 3.4

37. 1000, 200, 40, ... What number should come next?

a) 8

b) 10

c) 15

d) 5

38. 544, 509, 474, 439, ... What number should come next?

a) 404

b) 414

c) 420

d) 445

39. SCD, TEF, UGH, _____, WKL

a) CMN

b) UJI

c) VIJ

d) IJT

40. ELFA, GLHA, ILJA, _____, MLNA

a) OLPA

b) KLMA

c) LLMA

d) KLLA

41. CMM, EOO, GQQ, _____, KUU

a) GRR

b) GSS

c) ISS

d) ITT

42. In a certain code, '37' means 'which class' and '583' means 'caste and class'. What is the code for 'Caste'?

a) 3

b) 7

c) 8

d) Either 5 or 8

43. If ROSE is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for SEARCH?

a) 246173

b) 214673

c) 214763

d) 216473

44. In a language A is coded as 1, B is coded as 2, then FACE is coded as

a) 1356

b) 6135

c) 6315

d) 6134

45. In a certain code FLOWER is coded as 36 and SUNFLOWER is coded as 81, then how to code FOLLOWS?

a) 42

b) 49

c) 63

d) 36

46. In a code language, A is written as B, B is written as C, C is written as D and so on, then how will SMART be written in that code language?

a) TLBSU

b) SHBSU

c) TNBSU

d) SNBRU

47. If Go = 32, SHE = 49, then SOME will be equal to

- a) 56 b) 58 c) 62 d) 64

48. **Question:** On which date of the month was Anjali born in February 2004?

Statements: I. Anjali was born on an even date of the month.

II. Anjali's birth date was a prime number.

- a) I alone is sufficient while II alone is not sufficient
b) II alone is sufficient while I alone is not sufficient
c) Either I or II is sufficient
d) Both I and II are sufficient

49. **Statements:** All the harmoniums are instruments. All the instruments are flutes.

Conclusions: 1. All the flutes are instruments. 2. All the harmoniums are flutes.

- a) Only (1) conclusion follows b) Only (2) conclusion follows
c) Either (1) or (2) follows d) Neither (1) nor (2) follows

50. **Statements:** Some papers are pens. All the pencils are pens.

Conclusions: 1. Some pens are pencils. 2. Some pens are papers.

- a) Only (1) conclusion follows b) Only (2) conclusion follows
c) Either (1) or (2) follows d) Both (1) and (2) follow

Directions (51-55) In each of the following questions, out of the given alternatives, choose the one which best expresses meaning of the given word.

51. Wrath

- a) Jealousy b) Hatred c) Anger d) Violence

52. Lethargy

- a) Laxity b) Impassivity c) Serenity d) Listlessness

53. Diligent

- a) Intelligent b) Energetic c) Modest d) industrious

54. Bounty

- a) Donation b) Gift c) Pleasure d) Reward

55. Mystique

- a) Fame b) Reputation c) Admirable Quality d) Popularity

Direction (56-60) In each of the following questions, choose the word opposite in meaning to the given word.

56. Fraternity

- a) Hospitability b) Hostility c) Brotherhood d) Enmity

57. Mawkish

- a) Sentimental b) Intelligent c) Certain d) Carefree

58. Magnify

- a) Induce b) Diminish c) Destroy d) Shrink

59. Vanquish

- a) Surrender b) Debase c) Destroy d) Ruin

60. Malicious

- a) Boastful b) Indifferent c) Kind d) Generous

Directions (61-65) In each of the following questions, and Idiomatic expression is given followed by alternatives, choose the one which best expresses the meaning of the given idiom.

61. To turn over a new leaf

- a) To change completely one's course of action
 b) To shift attention to new problems after having studied the old ones thoroughly
 c) To cover up one's faults by wearing new marks
 d) To change the old habits and adopt new ones
62. To talk one's head off
 a) To talk loudly b) To talk in whispers c) To talk to oneself d) To talk excessively
63. To throw down the glove
 a) To resort to wrong tactics b) To give a challenge
 c) To accept defeat d) To reject the prize
64. To flog a dead horse
 a) To act in a foolish way b) To waste one's efforts
 c) To revive interest in an old subject d) To revive old memories
65. To play fast and loose
 a) To beguile others b) To be winning some times and losing at other times
 c) To play with someone's feelings d) To play tricks

Directions (66-70): In each of the following questions, out of the four alternatives, choose the one which can be substituted for the given words/sentences

66. Bringing about gentle and painless death from incurable disease
 a) Suicide b) Euphoria c) Gallows d) Euthanasia
67. Large scale departure of people
 a) Migration b) Emigration c) Immigration d) Exodus
68. One who always runs away from danger
 a) Escapist b) Timid c) Coward d) Shirker
69. Simplest and smallest form of plant life, present in air, water and soil; essential to life but may cause disease
 a) Virus b) Amoeba c) Bacteria d) Toxin
70. One who loves mankind
 a) Anthropologist b) Philanthropist c) Seismologist d) Optometrist

Directions (71-75) In each of the following questions, a word has been written in four different ways out of which only one is correctly spelt. Find the correctly spelt word.

- 71 a) Alienate b) Allienate c) Alienat d) Alienatte
- 72 a) Accommodetion b) Accomodation c) Accommodtion d) Accommodation
- 73 a) Leisure b) Leissure c) Leasure d) Lesiure
- 74 a) pasanger b) pessenger c) pesanger d) passenger
- 75 a) comitment b) comitment c) commitment d) comitmant

Direction (76-80): In the questions given below, some of the sentences have errors and some have none. Find out which part of a sentence has an error. If there is no mistake, the answer is 'No error'.

- 76 Man needs (a)/ security and leisure. (b) / of free thinking. (c) / No error (d)
- 77 I am not wealthy,(a)/so I cannot afford (b)/to buy a expensive car(c) no error(d)
- 78 The man (a)/ cannot live (b) / by bread alone. (c) / No error (d)
- 79 A person I met (a) / in the theatre (b) / was the playwright himself. (c) / No error (d)
- 80 To perform this experiment, (a) / drop little sugar (b) / into a glass of water. (c) / No error (d)

Directions (81-85):: in each question, a part of sentence is printed in italics. Bellow each sentence, some phrases are given which can substitute the italicized part of the sentence. Find out the phrase which can correctly substitute that part of the sentence. if sentence is correct as if is, the answer is' No correction is required" or No improvement.

- 81 The police broke away the meeting as it turned violent.
 a) Broke up b) Broke off c) broke through d) No improvement
- 82 They are working for the upliftment of their village.
 a) uplift of b) uplifting of c) uplifting d) No improvement
- 83 My mother asked me when would I have a glass of milk.
 a) I will b) I would c) I shall d) No improvement
- 84 The teacher asked, "why you are late?"
 a) why you were late b) why late you are c) why are you late d) No correction required
- 85 The train left before we reached the station.
 a) had left b) would have left c) has had left d) No improvement

Directions (86-90) Rearrange the given sentences A,B,C,D ,and E in the proper sequence so as to form a meaningful paragraph and then answer the questions given below them.

- A. As he got up, a frightened native told him about the man –eater.
 B. When he approached the thick bush, he saw the lion running towards him.
 C. To m was awakened by the fearful screams of the villagers.
 D. I n a stage of fright, a shot was fired accidentally by Tom, but it hit the Lion.
 E. Tom decided to chase the lion and took out his gun.

86. Which of the following should be the first sentence?
 a) A b) B c) C d) D
- 87 Which of the following should be the second sentence?
 a) A b) B c) C d) D
- 88 Which of the following should be the third sentence?
 a) A b) B c) C d) E
- 89 Which of the following should be the fourth sentence?
 a) A b) B c) C d) D
90. Which of the following should be the last sentence?
 a) A b) B c) C d) D

Directions (91-100): Read the following passage carefully and answer the questions given below it.

Amnesty International's charge that 'tens of thousands' of political prisoners, including prisoners of conscience, are languishing in India jails and that prisoners are routinely tortured in this country has to be seen in a much wider context than the organization's annual report cares to do. In its overall appraisal of 151 countries, Amnesty has accused 112 of torturing prisoners, 63 of harboring prisoners of conscience, 61 of resorting to political killings and 53 of detaining people without a trial. Of these apparently overlapping categories, India seems to have been excluded from the list of the 61 which undertake political killings. The report has however, pointed out that scores of people in India die of torture in police and military custody and that many also simply disappear. Clearly, only a thin line separates the 61 charged with political murder from the rest. Before coming to such conclusions, however, it may also be necessary to classify the various countries according to their political systems. Torture by the security forces and killings at the behest of the government make no difference to the victims whether they are in a democratic country or a totalitarian one. It is also nobody's case that a democratic country is less culpable than a dictatorship in the event of human rights violations. But the point perhaps still needs to be made that torture of the system in a democracy in contrast to being an integral part of state policy in a country ruled by an autocrat who is answerable to no one.

India may be guilty of keeping 'tens of thousands' behind bars and of the other human rights abuses mentioned by Amnesty, but it still remains a qualitatively different place from a totalitarian country. It is in this respect that Amnesty has been less than fair. It has chosen to ignore the distinctions between the good, the bad and the ugly. The openness of Indian society will be evident to anyone who spends half an hour in one of its chaotic market-places or visits the law courts or watches a political rally or reads a newspaper or strikes up a conversation with any person on the roads. There is no sense of fear in India, as in a conversation with any person on the roads. There is no sense of fear in India, as in a dictatorship. There is also scope for securing relief from the heavy-handed behaviour of the authorities, even if the human rights commission has not yet lived up to expectations, Unless such points are recognized, Amnesty's assessment will seem to be a dry recital of statistics which may pillory India simply because of its larger population.

- 91 In the report, India has been excluded from which of the following categories of violating human rights?
- a) Torturing prisoners b) Detaining without trial
c) Political killings d) Harboursing prisoners of conscience
- 92 Which of the following is not true in the context of the passage?
- a) India is guilty of some human rights abuses
b) Amnesty International appraised all the democratic countries
c) There is overlapping of cases in the categories of human rights abuses.
d) India was one of the countries appraised by Amnesty International.
- 93 According to the passage, through which media or forum Amnesty International has hurled the charges?
- a) Seminar on Human rights b) Its Regional Report
c) Its Annual Report d) Its International Meet
94. The author of the passage
- a) agrees with the report b) disagrees with the report
c) hat conditions of disagrees prisons in India is bad d) supports the totalitarian approach
- 95 The Amnesty International's report is based on the information of how many countries?
- a) 63 b) 112 c) 131 d) None of these
- 96 The author suggests classification of various countries on one additional dimension. Which of the following is that dimension?
- a) Economic progress b) Human Rights c) Industrial progress d) Political systems
- 97 According to the passage, what does political murder in a democratic country signify?
- a) Failure of system b) Policy of the country
c) Need for autocratic rule d) Openness of society
- 98 Which of the following is the meaning of the phrase 'strike up' as used in the passage?
- a) hit sharply b) initiate c) discussion d) protest
- 99 Which of the following seems to be the main purpose of writing this passage?
- a) To highlight the sufferings of prisoners b) To condemn political killings
c) To highlight the role of Amnesty International d) To further the cause of human rights
- 100 According to the author, among the good, the bad and the ugly, what at worst is the situation in India?
- a) Good b) Bad c) Ugly d) Good or ugly

Hall Ticket Number :									
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R-19

Code: 19A35HT

III B.Tech. I Semester Regular Examinations February 2022

Automation and Robotics
(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks	CO	Blooms Level
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UNIT-I

- | | | | | |
|----|--|-----|-----|-------|
| 1. | List out the various types of flow lines. Discuss flow line with and without buffer storage. | 14M | CO1 | L1&L2 |
|----|--|-----|-----|-------|

OR

- | | | | | |
|----|---|----|-----|----|
| 2. | a) What are the various automation strategies and explain any one? | 7M | CO1 | L2 |
| | b) List the basic elements of automated system and explain any one. | 7M | CO1 | L1 |

UNIT-II

- | | | | | |
|----|---|-----|-----|----|
| 3. | a) State the advantage of a flexible assembly line. | 2M | CO2 | L2 |
| | b) Using an illustrative example, describe ANY ONE method of assembly line balancing. | 12M | CO2 | L2 |

OR

- | | | | | |
|----|---|-----|-----|----|
| 4. | What is the need for assembly line balancing? Explain any one of the methods of assembly line balancing, with suitable example. | 14M | CO2 | L2 |
|----|---|-----|-----|----|

UNIT-III

- | | | | | |
|----|--|-----|-----|-------|
| 5. | Define robot. Briefly explain the robot components with neat sketch. | 14M | CO3 | L1&L2 |
|----|--|-----|-----|-------|

OR

- | | | | | |
|----|--|----|-----|----|
| 6. | a) Briefly explain the different types (configurations) of robots. | 7M | CO3 | L2 |
| | b) Describe the types of joints used in robots. | 7M | CO3 | L2 |

UNIT-IV

- | | | | | |
|----|---|----|-----|----|
| 7. | a) Discuss about homogeneous transformation for translation and rotation. | 6M | CO4 | L2 |
| | b) Discuss about D-H notation for forward kinematics of robot. | | | |

OR

- | | | | | |
|----|--|----|-----|----|
| 8. | a) With an example differentiate forward and inverse kinematics. | 7M | CO4 | L2 |
| | b) Write down about Jacobians differential transformation. | 7M | CO4 | L2 |

UNIT-V

- | | | | | |
|----|---|----|-----|----|
| 9. | a) Explain Pneumatic actuators system with neat sketch. | 7M | CO5 | L2 |
| | b) Explain the working of a stepper motor. | 7M | CO5 | L2 |

OR

- | | | | | |
|-----|---|-----|-----|----|
| 10. | Explain the various types of sensors used in industrial robots in detail. | 14M | CO5 | L2 |
|-----|---|-----|-----|----|

*****END*****