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R18

Course Code: A30331

**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**

(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: **DYNAMICS OF MACHINERY****(Mechanical Engineering)**

Date: 05.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. How the principle of superposition is applied in computation of piston effort for vertical engine? 2 M
2. What is meant by gyroscopic couple? 2 M
3. Draw the Turning Moment Diagram (TMD) for a single cylinder four-stroke engine for two continuous working cycles and indicate the excess energy stored in the flywheel. 2 M
4. What is meant by coefficient of sensitiveness? 2 M
5. Justify the statement 'Though cone clutches provide high frictional torque yet they have become obsolete'. 2 M
6. Deduce the relation for ratio of tensions in a band brake. 2 M
7. Justify why complete balancing is not possible in reciprocating engine? 2 M
8. Define Tractive force and Swaying couple. 2 M
9. Why critical speed is encountered in shaft? 2 M
10. What are the conditions for free torsional vibrations of two rotor system. 2 M

PART-B**Answer the following. Each question carries TEN Marks.**

5x10=50M

- 11.A). The mass of turbine rotor of a ship is 20 tons and has radius of gyration of 0.6 m. Its speed is 2000 rpm. The ship pitches 6 degree above and 6 degree below the horizontal position. A complete oscillation takes 30 sec and the motion is simple harmonic. Determine (i) Maximum gyroscopic couple and maximum angular acceleration of the ship during pitching. (ii) The direction in which the bow will tend to turn when rising, if the rotation of the rotor is clockwise when looking from the left. 10M

OR

11. B). The length of crank and connecting rod of a horizontal engine has 200 mm and 1 m respectively. The crank is rotating at 400 rpm. When the crank has turned through 30° from the inner dead centre, the difference of pressure between cover and piston rod is 0.4 N/mm². If the mass of the reciprocating parts is 100 kg and cylinder bore is 0.4 meter, then calculate (i) Inertia force and force on piston, (ii) Piston effort and thrust on the sides of the cylinder walls. 10M

(P.T.O..)

12. A). i) The radius of gyration of a flywheel is 1 meter and the fluctuation of speed is not to exceed 1% of the mean speed of the flywheel. If the mass of the flywheel is 3340 kg and the steam engine develops 150 kW at 135 rpm, then Find Maximum fluctuation of energy and Coefficient of fluctuation of energy. 6M

ii) A flywheel of moment of inertia 9.8 kgm^2 fluctuates by 30 rpm for a fluctuation in energy of 1936 joules. Find the tire mean speed of the flywheel in rpm. 4M

OR

12. B). A proell governor has equal arms of length 300mm. The upper and lower ends of the arms are pivoted on the axis of the governor. The extension arms of the lower links are each 80mm long and parallel to the axis when the radii of rotation of the balls are 150mm and 200mm. the mass of each ball is 10 kg and the mass of the central load is 100kg. Determine the range of speed of the governor. 10M

13. A). Determine the axial force required to engage a cone clutch transmitting 20kW of power at 750 rpm. Average friction diameter of the cone is 400mm and average pressure intensity 60 kN/m². Semi cone angle is 100 and coefficient of friction is 0.25. Also find the width of the friction cone. 10M

OR

13. B). A simple band brake is applied to a drum of 500 mm diameter which rotates at 200 rpm. The angle of contact of the band is 260 degree. One end of the band is fastened to a fixed pin and the other end to the brake lever, 130 mm from the fixed pin. The brake lever is 700 mm long and is spaced perpendicular to the diameter that bisects the angle of contact. Assuming the coefficient of friction is 0.3, determine the necessary pull at the end of the lever to stop the drum if 30 kW of power is being absorbed. Also find the width of the band if its thickness is 4 mm and the maximum tensile stress is 40 N/mm². 10M

14. A). A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg, 400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm, and 80 mm in planes measured from A at 300 mm, 400 mm, and 700 mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be in planes X and Y. Distance between planes A and X is 100 mm, between X and Y is 400 mm and between Y and D is 200 mm. If balancing masses revolve at radius of 100 mm. (i) Determine the magnitude of balanced mass X. (ii) Compute the magnitude of balanced mass Y. (iii) Locate the angular position of mass X and Y 10M

OR

14. B). The following data apply to an outside cylinder uncoupled locomotive: Mass of rotating parts per cylinder = 360 kg, mass of reciprocating parts per cylinder=300kg, angle between cranks= 90°, crank radius= 0.3m, cylinder centers = 1.75m, radius of balance masses= 0.75m, wheel centers = 1.45m. If whole of the rotating and two-thirds of reciprocating parts are to be balanced in planes of driving wheels, find: (i) Magnitude and angular positions of balance masses. (ii) Speed in kilometers per hour at which the wheel will lift off the rails when the load on each driving wheel is 30 kN and the diameter of tread of driving wheels is 1.8m. 10M

(P.T.O.)

15. A). Derive an expression for the natural frequency of the free longitudinal vibration by 10M
(i) Rayleigh's Method (ii) Energy Method.

OR

15. B). A steel shaft 1.5 m long is 95 mm in diameter for the first 0.6 m of its length, 60 mm in diameter for the next 0.5 m of the length and 50 mm in diameter for the remaining 0.4 m of its length. The shaft carries two flywheels at two ends the first having a mass of 900 kg and 0.85 m radius of gyration located at the 95 mm diameter end and the second having a mass of 700 kg and 0.55 m radius of gyration located at the other end. Determine the location of the node and the natural frequency of free torsional vibration of the system. The modulus of rigidity of shaft material may be taken as 80 GN/m^2 . 10M

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R18

Course Code: A30332



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: **MANUFACTURING TECHNOLOGY**

(Mechanical Engineering)

Date: 07.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. List the different taper turning methods in lathe. 2 M
2. What is the purpose of tumbler gear mechanism of a lathe? 2 M
3. Differentiate drilling and reaming operation. 2 M
4. What is gang drilling machine? 2 M
5. Define cutting ratio in a shaper. 2 M
6. How are shaping machines specified. 2 M
7. What is meant by the term indexing? 2 M
8. List out the various milling operations. 2 M
9. How do you specify grinding wheels? 2 M
10. What do you mean by loading of grinding wheels? 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Enumerate with a neat diagram the principal parts of capstan and turret lathe. 10M
- OR**
11. B). Explain with neat sketches the single spindle automatic lathe. 10M
12. A). Explain the twist drill nomenclature and define various elements of twist drill. 10M
- OR**
12. B). With a neat sketch, explain the working of principal of a jig boring machine. 10M
13. A). Describe the principle and operation of a shaper with a neat sketch. 10M
- OR**
13. B). Describe the principle and operation of a slotter with a neat sketch. 10M
14. A). Explain the principal of operation of a gear hobbing. Give the advantages and limitation of gear hobbing. 10M
- OR**
14. B). List out different indexing mechanism in milling machine. Explain any two with neat sketches. 10M
15. A). Write briefly about broaching machine and its operations with neat sketches. 10M
- OR**
15. B). List out various abrasives used in a grinding wheel. Explain any three. 10M

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R18

Course Code: A30334



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: **THERMAL ENGINEERING**

(Mechanical Engineering)

Date: 09.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

- | | |
|---|-----|
| 1. Write the different methods to improve performance of rankine cycle. | 2 M |
| 2. List the advantages of high pressure boilers | 2 M |
| 3. Define critical pressure ratio. | 2 M |
| 4. What is the purpose of condenser? | 2 M |
| 5. Writes down the losses in steam turbines. | 2 M |
| 6. Define degree of reaction. | 2 M |
| 7. State the demerits of closed cycle gas turbine. | 2 M |
| 8. Draw the block diagram of closed cycle gas turbine plant and also represent the processes on T-S diagram with reheating processes. | 2 M |
| 9. Why a ram jet engine does not require a compressor and a turbine? | 2 M |
| 10. List the applications of rockets. | 2 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- | | |
|--|-----|
| 11.A). Classify boilers? Differentiate between water tube boiler and fire tube boilers. | 10M |
| OR | |
| 11. B). i) Explain the construction and working of Bobcock and Wilcox boiler with the help of a neat sketch. | 5M |
| ii) The following data were taken during the test on a boiler for a period of one hour: Steam generated = 6000 kg; Coal burnt = 800 kg, calorific value of coal = 31402 kJ/kg, quality of steam = 0.92. If the boiler pressure is 1.2 MPa and the feed water temperature is 55 °C, find the boiler equivalent evaporation and efficiency. | 5M |
| 12. A). Steam at a 3 bar with 10°C superheat is passed through a convergent nozzle. The velocity of steam entering the nozzle is 91.5 m/s the back pressure is 1.5 bar. Assume nozzle efficiency of 90%. Determine the area of the nozzle at exit. Discharge through the nozzle is limited to 0.45 kg/s take Cps (superheated steam) is 2.2 kJ/kg°C. | 10M |
| OR | |
| 12. B). Differentiate between jet condensers and surface condensers. | 10M |

(P.T.O.)

13. A). The velocity of steam exiting the nozzle of the Impulse stage of a turbine is 400 m/s. The blades operate close to the maximum blading efficiency. The nozzle angle is 20° considering equiangular blades and neglecting blade friction, calculate for a steam flow of 0.6 kg/s, the diagram power and the diagram efficiency. 10M

OR

13. B). Derive the expression for maximum blade or diagram efficiency of a single stage reaction turbine by considering the following conditions: 10M
- (i) The degree of reaction is 50%.
 - (ii) The moving and fixed blades are symmetrical.
 - (iii) The velocity of steam at exit from the preceding stage is same as velocity of steam at the entrance to the succeeding stage.

14. A). Briefly explain about thermal efficiency of open cycle gas turbine plant and also explain them with a neat sketch. 10M

OR

14. B). In an air-standard regenerative gas turbine cycle the pressure ratio is 5. Air enters the compressor at 1bar, 300K and leaves at 490K. The maximum temperature in the cycle is 1000K. Calculate the cycle efficiency, given that the efficiency of the regenerator and adiabatic efficiency of the turbine are each 80%. Assume for air the ratio of specific heats is 1.4. Also show the cycle on a T-S diagram. 10M

15. A). An aircraft engine operates at an altitude of 3000 meters above mean sea level and an aircraft speed of 525 kmph. The data for the engine is given below: 10M
- Inlet diffuser efficiency = 0.875, Compressor efficiency = 0.97, Velocity of air at compressor entry = 90 m/s, Temperature of air at compressor entry = 6.24°C , Temperature rise through the compressor = 230°C

Properties of air :

$$\gamma = 1.4, C_p = 1005 \text{ J/kg K, Density of air} = 0.909 \text{ kg/m}^3$$

Calculate

- (i) pressure ratio developed by the compressor
- (ii) power required by the compressor per unit flow rate of air
- (iii) the air- standard efficiency of the engine.

OR

15. B). Classify rockets and explain solid and liquid propellant rockets. 10M

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R18

Course Code: A30335



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: MACHINE DESIGN

(Mechanical Engineering)

Date: 12.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. What are the mechanical properties of Modulus of Elasticity? 2 M
2. Distinguish between Grey cast iron and white cast iron. 2 M
3. What are the advantages of welded joints compared with riveted joints? 2 M
4. Differentiate bolt, nut, stud and screw. 2 M
5. What are the criteria for the balance of shaft fitted with rotating masses at different positions along its length? 2 M
6. Differentiate between shaft, axle and spindle. 2 M
7. Define equivalent dynamic load of bearings. 2 M
8. What do you mean by critical pressure in bearing? 2 M
9. What is the requirement of spring while designing? 2 M
10. How will you find whether the given helical spring is a compression spring or tension spring? 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). i) Describe material properties hardness, stiffness and resilience. 5M
ii) What do you mean by Optimum design? What are the various optimization methods available? 5M

OR

11. B). i) What are the considerations that govern selection of materials while designing a machine component? 5M
ii) Define design. What is procedure involved in design process? How the machine design may be classified? 5M

12. A). A plate 100 mm wide and 12.5 mm thick is to be welded to another plate by means of parallel fillet welds. The plates are subjected to a load of 50 kN. Find the length of the weld so that the maximum stress does not exceed 56 MPa. Consider the joint first under static loading and then under fatigue loading. 10M

OR

12. B). Two mild steel tie bars for a bridge structure are to be joined by a double cover riveted butt joint. The thickness of the tie bar is 20 mm and carries a tensile load of 45 tones. Design the joint if the allowable stresses are: $f_t = 90 \text{ N/mm}^2$, $f_s = 75 \text{ N/mm}^2$, $f_c = 150 \text{ N/mm}^2$. 10M

(P.T.O.)

13. A). A solid shaft of 1.2m, long is supported on bearings at its end and transmits 2kW at 1440 rpm. The Ultimate shear stress for the shaft may be taken as 360MPa and factor of safety as 8. Determine the diameter of the shaft. 10M

OR

13. B). A steel shaft 1.25 m long, supported between bearings carries 1250 N pulley at its mid-point. The pulley is keyed to the shaft and receives 20 kW at 200 rpm. The belt drive is horizontal and the ratio of the belt tensions is 3:1. The diameter of the pulley is 600 mm. Compute the shaft diameter. 10M

14. A). A ball bearing is subjected to a radial load of 10 kN and a thrust load of 5 kN. The inner ring rotates at 1000 rpm. The average life is to be 5000 hours. What basic load rating must be used to select a bearing for this purpose? Take $F_a/C_o = 0.5$ and assume service factor 1.5. 10M

OR

14. B). Design a journal bearing for centrifugal pump from the following data. Load on the journal = 20000N, speed of the journal = 900Rpm, type of oil SAE10, for which the absolute viscosity at $55^{\circ}\text{C} = 0.017 \text{ kg/m-s}$, ambient temp of oil = 15.5°C , max bearing pressure for the pump = 1.5 N/mm^2 . Calculate also mass of the lubricating oil required for artificial cooling. If rise of temperature of oil be limited to 10°C , Heat dissipation coefficient = $1232 \text{ W/m}^2/^{\circ}\text{C}$. 10M

15. A). Design a closed coil helical spring subjected a tensile load of magnitude varying from 2500 N to 3000 N and the axial deflection of spring for this range of load is 6.5 mm. Design the spring, taking the spring index as 6 and safe shear stress for material equal to 465 MPa and modulus of rigidity $G = 84 \text{ KN/mm}^2$. 10M

OR

15. B). A leaf spring is subjected to a total load of 140KN. The other parameters of the spring are as follows: number of springs = 4, number of leaves in each spring = 10, allowable stress = 600MPa, span of the spring = 1000mm, deflection allowed = 80mm. Young's modulus of the spring $E = 200 \text{ KN/mm}^2$. Find the thickness and width of the leaves. 10M

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R18

Course Code: A30351



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: **NON DESTRUCTIVE TESTING METHODS**

(Mechanical Engineering)

Date: 14.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Describe visual inspection techniques. 2 M
2. Examine the factors affecting mechanical properties of materials. 2 M
3. Compare Fluorescent penetrant and Visible penetrant. 2 M
4. Why should the material be demagnetized after it is subjected to NDT? 2 M
5. List the application of thermography. 2 M
6. Demonstrate the eddy current sensing elements. 2 M
7. Describe the properties of Acoustic waves 2 M
8. List the elements associated with ultrasonic testing. 2 M
9. Describe computed radiography. 2 M
10. Write any four characteristics of X-ray. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Classify the different types of destructive and non - destructive testing methods and applications of each technique. 10M
- OR**
11. B). Summarize the principles of various non-destructive methods which are used to detect the material defects. State the advantage of any two NDT method. 10M
12. A). Discuss about the principles of liquid penetrant testing with neat sketch. Also bring out the advantages and limitations of the liquid penetrant testing. 10M
- OR**
12. B). Explain the following:
- i) Residual Magnetization. 7M
 - ii) Properties of magnetic particle used in MPT. 3M
13. A). i) Explain the Eddy current principle of eddy current testing with neat sketch. 7M
ii) List the advantage and limitation of eddy current test. 3M
- OR**
13. B). Explain the principle of thermography testing by passive approach and state the application of it. 10M

(P.T.O.)

14. A). Illustrate the principle of pulse echo method with neat sketch in ultrasonic testing method. 10M

OR

14. B). Discuss the following Ultrasonic inspection technique with neat sketch.

- i) Straight beam ultrasonic inspection method. 5M
- ii) Angle beam ultrasonic inspection method. 5M

15. A). Illustrate the components of X-ray generator with suitable sketch. 10M

OR

15. B). i) Discuss about the safety aspects related to Radiographic testing. 6M

ii) Write short notes on the penetrometers and sensitivity in radiography testing. 4M

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R18

Course Code: A30371

**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: REFRIGERATION & AIR CONDITIONING
(Mechanical Engineering)

Date: 14.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. What is refrigeration? Write units of refrigeration? 2 M
2. Write the Refrigeration needs of Air crafts. 2 M
3. What are the disadvantages of wet compression? 2 M
4. What is the effect of super heating of vapor on the COP? 2 M
5. List out the properties of ideal refrigerant. 2 M
6. Why global warming is increasing day-by-day? 2 M
7. What are the refrigerant and absorbent in Li-Br and water absorption system? 2 M
8. Write the principle of thermoelectric refrigeration 2 M
9. What do you understand by effective room sensible heat factor? 2 M
10. List out the advantages and disadvantages of viscous filters over dry filters. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). What are the factors to be considered for the refrigeration system for an aeroplane? Explain briefly. 10M

OR

11. B). An air refrigerator working on the principle of Bell-Coleman cycle. The air into the compressor is at 1 atm at -10°C . It is compressed to 10 atm and cooled to 40°C at the same pressure. It is then expanded to 1 atm and discharged to take cooling load. The air circulation is 1 kg/s, the isentropic efficiency of the compressor = 80%, the isentropic efficiency of the expander = 90%. Find the following: i) Refrigeration capacity of the system; ii) C.O.P of the system, Take $\gamma = 1.4$, $C_p = 1.00 \text{ kJ/kg } ^{\circ}\text{C}$. 10M

12. A). A refrigeration system operates with R12 refrigerant. The evaporator and condenser temperature are at -5°C and -35°C respectively. The actual suction to the compressor is at 15°C . If superheating of refrigerant vapour from -10°C to 20°C does not add any refrigerating effect: i) Determine the percentage increase in volume flow rate per ton of refrigeration compared with the saturation cycle; ii) Compare the COP for saturated and superheated cycles and iii) Determine the power required per TR. 10M

OR

12. B). List the commonly used refrigerants in practice and explain in detail desirable properties of refrigerants. 10M

(P.T.O..)

13. A). i) Give the classification of Evaporators and explain any two with neat sketch. 6M
ii) What is an azeotrope? Give some examples to indicate its importance. 4M

OR

13. B). Where air-cooled condensers are preferred over water-cooled condensers? Give examples with specific reasons. 10M

14. A). Explain the working of Electrolux ($\text{NH}_3\text{-H}_2$) refrigerator and state its advantages and disadvantages over conventional refrigerators. 10M

OR

14. B). For a steam jet refrigeration system, the steam enters the nozzle at 8 bar just dry saturated state. The condenser pressure is 0.07 bar and flash chamber is to be maintained at 5°C . The make-up water enters the flash chamber at 35°C . Taking nozzle, entrainment and compressor efficiencies are $\eta_n=0.94$, $\eta_e=0.75$ and $\eta_c=0.65$ respectively, compute (i) amount of steam per kg of vapour formed in the flash chamber, (ii) COP and (iii) volume of vapour leaving the flash chamber per ton per hour. 10M

15. A). What is the function of a filter and how are filters classified? 10M

OR

15. B). An air-conditioned auditorium is to be maintained at 27°C DBT and 60% RH. The ambient condition is 40°C DBT and 30°C WBT. The total sensible heat load is 100000 kJ/h and total latent heat load is 40000 kJ/h. 60% of the return air is re-circulated and mixed with 40% of makeup air after cooling coil. The condition of air leaving the cooling coil is at 18°C . Determine i) RSHF, ii) The condition of air entering the auditorium, iii) The amount of make-up air, iv) ADP and v) BPF of cooling coil. 10M

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R18

Course Code: A30555



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: **INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS**

(Common for EEE, MECH & ECE)

Date: 19.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. What is E-R Model? 2 M
2. Write the advantages of DBMS. 2 M
3. Write the SQL command to create an index. 2 M
4. Write about any 6 SQL data types. 2 M
5. Write a query to display average salary of Employee using aggregate functions. 2 M
6. Write a query to display employee details from Employee table where salary greater than Rs 50,000 and less than RS 90,000. 2 M
7. List any two PL/SQL Exceptions 2 M
8. What will you get by the cursor attribute SQL%ROWCOUNT? 2 M
9. What is the purpose of normalization? 2 M
10. What is Update Anomaly? 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Compare File based systems with database management system. 10M
- OR**
11. B). Explain in detail about set operations, grouping, aggregation operations. 10M
12. A). Write suitable examples for creating Primary Key, Foreign Key, Not Null, Unique, Check constraints. 10M
- OR**
12. B). Write in detail about Views and Indexes. 10M
13. A). List and explain with suitable examples SQL Comparison Operators. 10M
- OR**
13. B). Explain with suitable examples Group BY and Having Clause. 10M
14. A). Explain with suitable examples Packages in PL/SQL. 10M
- OR**
14. B). Discuss in detail about Control Statements in PL/SQL. 10M
15. A). Explain in detail second Normal Form with suitable examples. List few disadvantages of Normalization. 10M
- OR**
15. B). Explain Insert, delete, update anomalies. 10M

H.T No:

R18

Course Code: A36635



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech (Minors in AI&ML) V Semester Regular Examinations December-2022

Course Name: **FOUNDATIONS OF ARTIFICIAL INTELLIGENCE**

(Common for CIVIL, EEE, MECH, ECE, IT & CSC)

Date: 19.12.2022 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Define Artificial Intelligence. 2 M
2. Label the syntax for predicate logic. 2 M
3. Name the three types of classification problems in machine learning. 2 M
4. Compare supervised learning and unsupervised learning. 2 M
5. How to choose step size adaptively in Gradient descent method? 2 M
6. Suggest a real time example for linear regression. 2 M
7. Show the cost function for logistic regression. 2 M
8. Can we use logistic regression for multiple classes? How? 2 M
9. List out the applications of cluster analysis. 2 M
10. Mention the task of clustering. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Compare the procedural knowledge with declarative knowledge. 10M
- OR**
11. B). List out and explain any five mostly used artificial intelligence techniques. 10M
12. A). Analyze the role of matrix theory and statistics for machine learning. 10M
- OR**
12. B). Interpret the idea of machines learning from data with examples. 10M
13. A). Find the linear regression equation for the following set of data 10M
- | | | | | |
|---|---|---|---|----|
| X | 2 | 4 | 6 | 8 |
| Y | 3 | 7 | 5 | 10 |
- OR**
13. B). Demonstrate the functionality of Gradient descent method for linear regression. 10M
14. A). Examine the problem of overfitting with a suitable example. 10M
- OR**
14. B). Define classification. Illustrate the usage of logistic regression for performing classification. 10M
15. A). Show and interpret the how can we classify the Clustering algorithm. 10M
- OR**
15. B). Inspect the implementation of agglomerative hierarchical clustering. 10M
