**PA-2642** 

SEAT No. :

[Total No. of Pages : 3

[Max. Marks: 70

# [5927]-423

# B.E. (Mechanical Engineering) (402045C) ADDITIVE MANUFACTURING (2019 Pattern) (Semester - VII) (Elective - IV)

Time : 2<sup>1</sup>/<sub>2</sub> Hours]

Instructions to the candidates :

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of electronic pocket calculator is allowed.
- 5) Assume suitable data, if necessary.

Q1) a) Explain process Fused Deposition Modeling (FDM) with suitable sketch.Also write merits, demerits and application. [8]

b) Explain process Direct Ink Writing (DIW) with suitable sketch. [5]

c) Explain process Polyjet Printing with suitable sketch. [5]

#### OR

- Q2) a) Explain process Color Jet Printing (CJP) with suitable sketch. List it's Benefits, Drawbacks, Limitations and Applications.
   [8]
  - b) Explain process Electron Beam-based DED with suitable sketch. [5]
  - c) Compare Extrusion-Based Deposition with Energy Deposition Techniques. [5]
- Q3) a) Explain use of Metals in Additive Manufacturing with important process parameters, benefits, drawbacks, Limitations and appropriate applications.
   [6]

*P.T.O.* 

- b) Explain varieties of heat treatment applied in pre- and post-processing of additive manufacturing based products. [6]
- c) Write a short note on acetone treatment in post-processing of additive manufacturing based products. [5]

OR

# Q4) a) Explain the Process specific strategies used in quality control of material specific additive manufacturing based products. [6]

- b) Write a short note on DfAM based Process specific strategies. [6]
- c) Write a short note on Support Removal in post-processing of additive manufacturing based products. [5]

Q5) a) Explain the two approaches used in Photopolymerization process based 3D printers.

- b) Explain the Construction, Layout and sub-system of Selective Laser Sintering [SLS] process based 3D Printers. [6]
- c) Explain the Construction, Layout, sub-system and sub-type of Cartesian based 3D Printers' Topology/Layout Frame Designs. [6]
- Q6) a) Explain the Construction, Layout and sub-system of Binder Jetting process based 3D Printers.
  - b) Explain the Construction, Layout, sub-system and sub-type of Extruder Design used in Polymer based 3D Printer Construction. [6]
  - c) Explain the M-codes used in the Control software of Additive Manufacturing based 3D Printers. [6]
- Q7) a) Explain how additive manufacturing is used in Aerospace Industries. Also write merits, demerits and practical feasible applications with illustrations.
  - [9]
  - b) Write a short note on 4D Printing and its applications. [8]

- Q8) a) Explain how additive manufacturing is used in Machine-Tools Industries.Also write merits, demerits and practical feasible applications with illustrations. [9]
  - illustrations. [9]
    b) Explain how additive manufacturing is used in Personalized Surgery Sector. Also write merits, demerits and practical feasible applications with illustrations. [8]
    K \* \* \*

PA-961

SEAT No. :

[Total No. of Pages : 3

# [5927]-413

# B.E. (Mechanical)

# DYNAMICS OF MACHINERY

### (2019 Pattern) (Semester - VII) (402042)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if nessacary.

#### UNIT - I

- Q1) a) A vibrating system is defined by the following parameters m=3kg, K=100N/m, C=3N-sec/m. Determine (i) Damping factor (ii) Natural frequency of damped vibration (iii) Logarithmic decrement (iv) Ratio of two consecutive amplitude and (v) Number of cycles after which the original amplitude is reduced to 20 percent.
  - b) Derive the differential equation of motion for undamped free torsional vibration. [5]
  - c) What are the causes of vibration? Explain the advantages of vibration.

#### OR

- Q2) a) A spring mass system has spring stiffness 'K' N/m and a mass of 'm' kg it has a natural frequency of vibration as 112Hz. An extra 2kg mass is coupled to 'm' and the natural frequency is reduced by 2Hz. Find the values of 'K' and 'm'.
  - b) By using energy method find the natural frequency of undamped free longitudinal vibrations. [5]
  - c) List the different types of damping and explain in detail any one type of damping? [4]

*P.T.O.* 

#### <u>UNIT - II</u>

- **Q3)** a) Explain critical speed of shaft carrying single rotor.
  - b) A machine of mass 1000kg is acted upon by an external force of 2450N in 1500rpm. To reduce the effect of vibration, isolators of rubber having a static deflection of 2mm under machine weight and an estimated damping factor of 0.2 are used. Determine. [10]

[8]

[8]

- i) Amplitude of vibration of machine.
- ii) Force transmitted to the foundation.
- iii) Phase lag
- iv) Phase angle between transmitted force and exciting force.
- v) Speed at which the maximum amplitude of vibration would occur. OR
- Q4) a) Explain the significance of frequency response curves.
  - b) An electric motor running at 1500 rpm is mounted on five springs and the force transmitted is one eleventh of the impressed force. The weight of the motor is 125 N while the armature weighs 35 N with its center of gravity 0.05 cm from the rotational axis. Determine: (i) Stiffness of each spring, (ii) Natural frequency of the system, (iii) Dynamic force transmitted to the base at operating speed. [10]

### <u>UNIT - III</u>

Q5) a) An electric motor running at 1500 rpm is mounted on five springs and the force transmitted is one eleventh of the impressed force. The weight of the motor is 125 N while the armature weighs 35 N with its center of gravity 0.05 cm from the rotational axis. Determine: (i) Stiffness of each spring, (ii) Natural frequency of the system, (iii) Dynamic force transmitted to the base at operating speed.



- Explain the concept of torsionally equivalent shaft and derive the equation b) for its equivalent length. [8]
  - OR
- Two subway cars as shown in Fig. have 2000 kg mass each and are **Q6)** a) connected by a coupler. The coupler can be modelled as a spring of stiffness k = 280 kN/m. Write down the equations of motion and determine the natural frequencies and mode shapes. [10]



- Explain the combined rectilinear and angular modes of vibration. b) [8]
- **Q**7) a) What are various frequency measuring instruments? Explain any one in detail. [8]
  - Explain in brief various sources of noise. b) [5]
  - Explain anechoic chamber and reverberant chamber? [4] c)

### **O**R

- What is meant by time domain and frequency domain analysis? Explain **08)** a) how frequency spectrum can be used to detect vibration related faults.
  - Write short note on "Noise control in industries". [5] b)

[4]

Write short note on Condition monitoring of machines. c)

ana. ion relax \* 3

Total No. of Questions : 8]

**PA-960** 

[Total No. of Pages : 5

[Max. Marks: 70

[5927]-412

# B.E. (Mechanical & Automobile) HEATING, VENTILATION, AIR - CONDITIONING AND REFRIGERATION

### (2019 Pattern) (Semester - VII) (402041)

Time : 2<sup>1</sup>/<sub>2</sub> Hours]

Instructions to the candidates:

- 1) Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of scientific calculator is allowed.
- 5) Assume suitable data, if necessary.

**Q1)** a) Explain with a neat sketch Thermostatic Expansion Valve. [5]

- b) Discuss the following terms used in thermodynamic analysis of Simple Ejector Refrigeration Cycle. [6]
  - i) Entrainment Ratio
  - ii) Entrainment efficiency
  - iii) Nozzle efficiency
- c) Explain with a neat sketch Low Pressure (LP) cut off used in VCR cycle.

OR

- Q2) a) Distinguish between the air cooled and water cooled condensers. [4]
  - b) Explain with neat schematic low temperature control in VCR cycle. [6]
  - c) Explain with neat schematic Simple Ejector Refrigeration System. [7]
- **Q3)** a) What is CLTD method? How it connects with time lag and decrement factor? [6]
  - b) A commercial shop has following loads : [12]
    Room sensible heat : 58.15 kW
    Room latent heat : 14.54 kW

The summer outside and inside design conditions are :

Outside : 40°C DBT, 27°C WBT

Inside 25°C DBT, 50% RH

 $70 \text{ m}^3/\text{min}$  of ventilation air is used. Determine the following if the by-pass factor of the cooling coil is 0.15.

- i) Ventilation load
- ii) Grand total heat
- iii) Grand sensible heat factor
- iv) Effective room sensible heat factor

v) Apparatus dew point

#### OR

- Q4) a) Explain the ASHARE comfort chart showing the comfort zones for winter and summer. Also explain factors (any two) affecting human comforts.[10]
  - b) Atmospheric air at 30°C dry bulb temperature and 75% relative humidity enters a cooling coil at a rate of 200m<sup>3</sup>/min. The coil dew point temperature is 14°C and the by-pass factor of the coil is 0.1. [8] Determine :
    - i) The temperature of an leaving the cooling coil;
    - ii) The capacity of the cooling coil in tonnes of refrigeration and in kW
    - iii) The amount of water vapour removed per minute; and
    - iv) The sensible heat factor for the process.

**Q5)** a) What is infiltration and Ventilation?

A Duct of Rectangular cross section  $600 \text{ mm} \times 400 \text{ mm}$  carries  $90 \text{m}^3/\text{min}$  of air having density of  $1.2 \text{ kg/m}^3$ . Determine the equivalent diameter of the circular duct; [8]

- i) When the quantity of air carries in both the cases is same;
- ii) When velocity of air in both cases is same.

Take friction factor is 0.011. Also calculate pressure loss per 100m length of duct.

c) Explain Fan Coil System? Write application of various types of Fans.[6]

[5927]-412

b)

OR

- *Q6)* a) What do you mean by Infiltration? Explain Natural Ventilation induced by wind. [5]
  - b) Using Equal friction method, determine the duct diameter and velocity for section AB, BD and BC. Assume velocity in the main duct AB = 600m/min. Also Calculate maximum pressure drop in the duct system. Distance AB = 30m, Distance BC = 30m and Distance BD = 10m. Refer the figure as given below : [7]



c) Explain any two types of "Air Distribution System" used in Air Conditioning system. [6]

[6]

[5]

- Q7) a) Explain with neat sketch winter air conditioning system.
  - b) Explain Thermal storage air conditioning system.
  - c) Write a short note on liquid spray tower.

#### OR

- **Q8)** a) Explain with neat sketch central air conditioning system. [6]
  - b) Explain with neat diagram indirect evaporative cooling air conditioning system. [6]
  - c) Write a note on clean room air conditioning system. [5]



[5927]-412



[5927]-412

PA-965

SEAT No. :

[Total No. of Pages : 3

[Max. Marks : 70

#### [5927] 418

# B.E. (Mechanical Engineering) INDUSTRIAL ENGINEERING

(2019 Pattern) (Semester - VII) (402044D) (Elective - III)

Time : 2<sup>1</sup>/<sub>2</sub> Hours] Instructions to the condidates :

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right side indicate full marks.
- 3) Use of electronic calculator is allowed.
- 4) Assume suitable data if necessary.

Q1) a) What do you mean by plant Location? Mr. Vishal wants to start his new plant, for this suggests which are the different factors that he should consider while selecting location for his new plant? [6]

b) Explain process layout with suitable sketch. [6]

c) Explain types of material flow patterns to achieve optimum flow of material in the plant? [5]

### OR

**Q2)** a) Explain the term material handling equipment's? Elaborate any four different types of material handling equipment's with suitable applications?

[9]

b) Compare product layout and Process Layout and explain factors affect while selecting plant layout? [8]

Q3) a) Explain the term Line Balancing with its objectives? Compare Job Production and Batch Production? (any 4 points) [9]

*P.T.O.* 

List any six functions of production planning and control. b)

Past data on the sale of Diesel engines for the last 12 years is given below. By the method of three yearly moving averages establish the trend values and forecast demand for 13th year. If the actual demand for 13th year is 540 nos. What shall be the forecast of 14th year. Take value of smoothing constant is 0.3.

Year	1	2	3	A	5	6	7	8	9	10	11	12
Sale numbers	335	350	330	340	380	410	430	440	430	460	500	560
OR												

- What is demand forecasting? What are applications of demand forecsting? **Q4)** a) Explain Moving average method of demand forecasting. [9]
  - For a water bottle, demand is given below. Forecast for the month May b) was 160 Units with a smoothing constant of 0.20 and using first order exponential smoothing what is forecast for month of Ocotober? [9]

Month	Actual Demand
May	250
June	180
July	200
August 🔨	260
September	250

- 102 1202 3.48°.0 Elaborate role of materials management in cost reduction and value **Q5)** a) improvement? Also explain the term "ABC analysis". [9]
  - Explain vendor rating system with vendor rating criteria? Also explain b) objectives of JIT. [9]

OR

- *Q6*) a) What is inventory control? Explain
  - i) MRP I
  - ii) ERP with different module
  - b) The Prisha enterprises use EOQ logic to determine the order quantity for its various components and are planning its orders. The Annual consumption is 80,000 units, Cost to place one order is Rs.1200, Cost per unit is Rs.50 and carrying cost is 6% of unit cost. Find, [9]
    - i) ECO,
      ii) No. of order per year,
      iii) Ordering Cost and Carrying Cost
      iv) Total Cost of Inventory.
- Q7) a) What is "value analysis"? Explain types of value?
  - b) Explain Rapid Entire Body Assessment (REBA) with level of MSD risk. [6]
  - c) Write a short note on "KRA"? [5]
- (Q8) a) Elaborate the term "merit rating"? Explain any 4 methods of merit rating?
  - b) Define job evaluation? What are its objectives? Explain procedure of job evaluation?
    (8)

[5927]-418

[9]

[6]

**PA-2641** 

SEAT No. :

[Total No. of Pages : 2

[Max. Marks : 70

# [5927]-421

# B.E. (Mechanical Engineering) PRODUCT DESIGN AND DEVELOPMENT (2019 Pattern) (Semester - VII) (Elective - IV) (402045A)

Time : 2<sup>1</sup>/<sub>2</sub> Hours] Instructions to the candidates :

- 1) Solve Q,1 or Q,2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of electronic pocket calculator is allowed.
- 5) Assume suitable data, if necessary.

<b><i>Q1</i></b> ) a)	List down different methods used for product teardown process and explain any one. [7]
b)	Describe in detail benchmarking [6]
c)	What is concept analysis? List down different aspects of concept analysis.
	OR [4]
<b>Q</b> 2) a)	What is concept selection? Explain Pugh's chart with example. [7]
b)	Write a short note on FAST method.
c)	What is product policy of an organization? List down various product
	policies. [4]
$(0^2)$	What is no dust modularity? Evaloin types of Matularity [7]
QS(a)	what is product modularity? Explain types of Modularity. [7]
b)	Explain BOM with example. [6]
c)	What is Tolerance? Describe the types of tolerances.[4]
	OR OR
<b>Q4</b> ) a)	What is product architecture? Explain types of product architecture. [7]
b)	What is dimensioning? Describe arrangement of dimensioning. [6]
c)	What is Fit? Describe the types of Fits. [4]
	P.T.O.
	1.1.0.

List down different methods of economic analysis of product and explain **Q**5) a) break even analysis. [8] What is Rapid prototyping? Define and enlist various methods of b) prototyping. [6] Define letter of intent, purchase order and product costing in vendor c) development. [4] OR Explain steree lithography in detail with suitable sketch. **Q6**) a) [8] What is production capacity planning? Explain the steps followed in b) planning. [6] Why homologation certificate is important in design and development? c) Explain with example. [4] **Q**7) a) Write a short note on APQP. [8] Write a short note on DFMEA. b) [6] Discuss the elements of PLM in detail c) [4] OR List down types of FMEA and explain any one with example. **Q8**) a) [8] b) Write a short note on PDM [6] Discuss design for robustness in detail. c) [4] 661-82-1-1001 1002 13-26-59 (61-89-1-1001 1002) (61-89-1-1001 1002) (61-89-1-1001 1002) (61-89-1-1002) (61-89-1

Total No. of Questions : 8]

**PA-962** 

SEAT No. :

[Total No. of Pages : 3

## [5927]-414 B.E. (Mechanical Engineering)

TURBOMACHINERY

(2019 Pattern) (Semester - VII) (402043)

Time : 2 Hours J

Instructions to the candidates.

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Use of logarithmic tables, slide rule, and electronic pocket calculator is allowed.
- 4) Figure to the right indicate full marks.
- 5) Assume Suitable data, if necessary.

*Q1*) a) Classify Turbo machines.

- b) State Impulse Momentum Principle. Derive an expression for force exerted by jet of water on flat inclined plate. [6]
- c) A Pelton wheel is to be designed for the following specifications: Shaft Power = 11,772kW; Head = 380 meters; Speed = 750 r.p.m; Overall efficiency = 86%; Jet diameter is not to exceed one sixth of the wheel diameter. Determine: [6]
  - i) The wheel Diameter
  - ii) The number of jets required, and
  - iii) Diameter of the jet. Take  $Kv_1 = 0.985$  and  $Ku_1 = 0.45$ OR

(Q2) a) Explain construction and working of Kaplan Turbine with neat sketch.[6]

b) What is the need of draft tube? Enlist types of draft tube with neat diagram.

- [4]
- c) The external and internal diameters of inward flow reaction turbines are 1.20 m and 0.6 m respectively. The head on the turbine is 22 m and velocity of flow through the runner is constant and equal to 2.5 m/s. The guide blade is given as10° and runner vanes are radial at inlet. If the discharge at outlet is radial, determine: [4]
  - i) The speed of the turbine
  - ii) The vane angle at the outlet of the runner

[Max. Marks: 50

[2]

- Q3) a) What do you mean by compounding of steam turbines? Explain any one suitable example with neat sketch [6]
  - b) In a De Laval Steam turbine steam issues from the nozzle with a velocity of 1200 m/s. The nozzle angle is 20°, the mean blade velocity is 400 m/s, the inlet and outlet angles of blades are equal. The mass of steam flowing through turbine per hour is 1000 kg. Determine the following by graphical method [6]
    - i) Tangential Force
    - ii) Power Developed

iii) Blade Efficiency

Take Velocity blade coefficient as 0.8

#### OR

Q4) a) Explain governing of steam turbine with any one method.

b) Following data refers to particular stage of Parson's reaction turbine.[6] The speed of turbine = 1500 rpm Mean Diameter of rotor = 1m Stage efficiency = 0.8 Blade outlet angle = 20° Speed Ratio = 0.7 Determine the available enthalpy drop in the stage by graphical method.

[6]

#### *Q5)* a) State & explain:

- i) Unit Speed
- ii) Unit Discharge
- iii) Unit Power
- b) A centrifugal pump delivers water against a net head of 14.5 meters and a design speed of 1000 r.p.m. The vanes are curved back to an angle of 30° with the periphery. The impeller diameter is 300 mm and outlet width is 50 mm. Determine the discharge of the pump if manometric efficiency is 95%.

OR

- *Q6)* a) Explain the following:
  - i) Priming of Centrifugal Pump
  - ii) Net Positive Suction Head
  - iii) Cavitation
  - b) A centrifugal pump discharges 0.15 m<sup>3</sup>/s of water against head of 12.5m, the speed of impeller being 600 r.p.m. The outer and inner diameters of impeller are 500 mm and 250 mm respectively and the vanes are bent back at 35° to the tangent at exit. If the area of flow remains 0.07 m<sup>2</sup> from inlet to outlet, Calculate: [6]
    - i) Manometric Efficiency of pump
    - ii) Vane angle at inlet
- *Q7*) a) Explain construction and working of Axial flow Compressor with neat diagram.[6]
  - b) A centrifugal compressor develops a pressure ratio of 5 and an air consumption of 30 kg/s. The inlet temperature and pressure are 15°C and 1 bar respectively. If isentropic efficiency is 0.85, Calculate [6]
    - i) Work done
    - ii) Exit total temperature
    - iii) The power required

#### OR

- (Q8) a) Explain surging and chocking phenomenon in centrifugal compressors with neat diagram. [6]
  - b) Differentiate between centrifugal compressor and axial flow compressor.

[4]

c) Give classification of centrifugal compressors. [2]

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Total No. of Questions: 8]

**PA-991** 

SEAT No. :

[Total No. of Pages : 2

[5927],460

**B.E.** (Honors in Robotics)

INDUSTRIAL ROBOTICS AND AUTOMATION

(2019 Pattern) (Semester-VII) (404181)

*Time : 2<sup>1</sup>/<sub>2</sub> Hours] Instructions to the candidates:*  [Max. Marks: 70

- 1) Answer Q1 or Q2 and Q3 or Q4 and Q5 or Q6 and Q7 or Q8.
- 2) Neat diagram must be drawn whenever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Use of Calculator is allowed.
- 5) Assume suitable data if necessary.

Q1) a) What is pneumatic system? List the industrial applications of it and elaborate any one.

- b) List different methods to control pneumatic control system. What is Karnaugh - Veitch mapping? [6]
- c) Enlist the basic components in pneumatic system and explain them in detail. [6]
- **Q2)** a) Draw different types of valve symbols and explain any one with the example. [6]
  - b) List the advantages and disadvantages of pneumatic system. [6]
  - c) Draw and explain single acting and double acting cylindrical actuators with proper operation [6]
- Q3) a) Write the steps to design of parts for high speed feeding and orienting.State different feeding difficulties. [9]
  - b) How to perform the analysis of an assembly. Explain with one example.

[8]

#### OR

- Q4) a) Explain in detail how high speed automatic insection is possible in robotic assembly. State general rules for product design and automation. [9]
  - b) State design features of CNC systems. Explain drive system for CNC machine tools. [6]

- 05) a) Define Machatronics. Explain different key elements of the Mechatronics system. [6] State and explain different stages in designing a Mechatronics system. b) [6] Write a case study on Pick and Place robot. [6] c) OR Give the classification of a Mechatronics System. [6] **Q6)** a) How mechatronics system design is different than traditional system? b) [6] Write a case study on engine management system. c) [6] Classify the pumps. Give characteristics and selection criteria for Pumps. **Q7)** a) [9] With an example explain the calculations for power and velocity during b) extension and retraction. [8]
- **Q8)** a) With a suitable diagram and PLC ladder diagram explain how to control two cylinders? [9]
  - b) Classify the control valves used in hydraulic system. Explain pressure control valves in detail with its functions.

[5927]-460

Total No. of Questions : 8]

**PA-1677** 

[Total No. of Pages : 2

SEAT No. :

# [5927]-465

# **B.E.** (Computer Engineering) HONOURS IN DATA SCIENCE Machine Learning and Data Science (2019 Pattern) (Semester - VII) (410501)

[Max. Marks: 70

[6]

[6]

Instructions to the candidates :

Time : 21/2 Hours

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

Explain K-Means algorithm with an example. *Q1*) a)

- b) How to measure the quality of clustering? Explain any three measures. [6]
- What are different types of partitional clustering? Explain any two of c) them. [6]

#### Explain KNN algorithm with example. **Q**2) a)

Cluster the following dataset using Agglomerative Hierarchical clustering b) ECRO 1101002233 technique -[6]

	X	X <sub>2</sub>
A	10	5
В	1	4
C	5	8
D	9	2
Е	12	10
F	15	8
G	7	7

Also show intermediate steps

What is the role of dendrograms in choosing number clusters in hierarchical c) clustering? [6]

*P.T.O.* 

<b>Q</b> 3) a)	Enlist limitations of MLP. [4						
b)	What are the types of artificial neural network?[6]						
c)	What is the role of the activation functions in Neural Networks? List down the names of some popular activation functions used in Neural Networks.						
	OR						
<b>Q4</b> ) a)	Explain Multilaver Perception. [4						
b)	Explain Generalized Delta Learning Rule. [6						
c)	How does the learning rate affect the training of the Neural Network						
	What do you mean by Hyperparameters? [7						
<b>Q</b> 5) a)	Explain the different layers in CNN. Explain the significance of the RELU						
	Activation function in Convolution Neural Network [6						
b)	Illustrate Long-short Term Memory along with its structure. [6						
c)	Explain the terms "Valid Padding" and "Same Padding" in CNN. Lis						
	down the Hyperparameters of a Pooling Layer. [6						
	OR						
<b>Q6</b> ) a)	Explain CNN Architecture along with diagram. [6						
b)	Explain Recurrent Neural Network. [6						
c)	Illustrate Gradient descent optimization using an example. [6						
<b>Q</b> 7) a)	Explain the process of text preprocessing. [6						
b)	Write short note on document representation.						
c)	What are the practical uses of feature extraction? [5						
	OR						
<b>Q8</b> ) a)	What are various text similarity measures? Explain any two of them. [6						
b)	Explain various feature selection methods. [6						
c)	Illustrate tokenization with an example. [5						
	93.6×						

[5927]-465

Total No. of Questions : 8]

**PA-2674** 

### [5927]-463

#### B.E

## HONOURS IN ARTIFICIAL INTELLIGENCE & MACHINE *L***EARNING**

# (2019 Pattern) (Semester - VII) (410301)

[Max. Marks : 70

Instructions to the candidates :

Time : 2<sup>1</sup>/<sub>2</sub> Hours

- Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8. 1)
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

What is out of bag samples in random forest? Explain it with example.[8] *Q1*) a)

Explain with example the variant of SVM, the Support vector regression. b) [9]

State and explain different types of kernel functions in SVM? *O2*) a) [9]

- What is random Forest? Write an algorithm for random forest. b) [8]
- *Q3*) a) Explain Bayesian View of Learning and Dimensionality Reduction neural network. [9]

What is perceptron? Explain how to train perception in detail. b) [9]

#### OR

- **Q4)** a) What are two paradigms for Parallel Processing of neural network. State the scenario when to use which type of paradigm [9]
  - Br. B Write a short note on : b) [9]
    - i) Multilayer perceptrons
    - MLP as a Universal Approximator ii)

*P.T.O.* 

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- **Q5)** a) Using K-means clustering algorithm, cluster following data into two cluster. {2, 4, 10, 12, 3, 20, 30, 11, 15} Explain each step in detail. [9]
  - b) Write a short note on : [8]
    - Self Organizing Maps i)
    - ii) PCA - Spectral Clustering

Items Bought

B, C, D, E

B.C

A, C, D

A, C, D, E

A, B, C, D

TID

T

 $T_2$ 

T3

T4

T5

- OR
- **Q6)** a) A database has five transactions. min sup = 40% and confidence = 40%. [8]

Find all frequent itemsets using Apriori algorithm.

- Write and explain K-means clustering algorithm with example. b) [9]
- Why is naive Bayesian classification called "naive"? Explain naive Bayesian **Q**7) a) classification algorithm in detail. [9]
  - What is HMM? Explain three Basic Problems of HMMs in detail. b) **[9**]
    - OR
- What is regression and state its applications. Find linear regression equation **Q8)** a) for the following two sets of data : [9]

Х	2	4	6	80	P
у	3	7	5	10	0

[9]

- Write a short note on : b)
  - i) d-Separation
  - Junction Trees ii)

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