R16

SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018
MANAGEMENT SCIENCE
(Common to Civil Engineering and Petroleum Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	Define Organization.	[2M]
	b)	Give significance of Quality Control.	[2M]
	c)	What is Performance Management?	[2M]
	d)	Explain the concept on PERT.	[3M]
	e)	Discuss Corporate Planning Process.	[3M]
	f)	Define MIS.	[2M]

PART -B

2.	a)	Explain the importance and the principles of Taylor's Scientific Management.	[7M]
	b)	What is Motivation? Explain Abraham Maslow's needs Hierarchy theory?	[7M]
3.	a)	Define EOQ. Write about the factors that influence in determination of EOQ?	[7M]
	b)	What are the objectives of Work Study?	[7M]
4.	a)	What is Merit Rating? How it is useful for Job Evaluation.	[7M]
	b)	State the functions of channels of distribution.	[7M]

5. a) Following data relates to a certain project.   [7M]

Activity	Optimistic Time	Most likely Time	Pessimistic Time
1-2	2	5	14
1-3	3	12	21
2-4	5	14	17
3-4	2	5	8
4-5	1	4	7
3-5	6	15	30

Find out: i) Construct the network.   ii) Identify the critical path and duration
of the project.

	b)	What do you mean by crashing a network? State the step by step procedure of crashing.	[7M]
6.	a)	Define strategic management. Describe the process of strategic management.	[7M]
	b)	What is Mission? What are the characteristics of a good Mission statement?	[7M]
7.	a)	Explain the concept of Balanced Score Card.	[7M]
	b)	Define Supply chain Management. Explain its functions.	[7M]

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Code No: R1631011

(**R16**)

(SET - 2)

III B. Tech I Semester Regular Examinations, October/November - 2018
MANAGEMENT SCIENCE
(Common to Civil Engineering and Petroleum Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	Explain the functions of a manager.	[2M]
	b)	What is ABC analysis?	[2M]
	c)	What is meant by Merit Rating?	[2M]
	d)	Define HRD.	[3M]
	e)	Explain Mission statement.	[3M]
	f)	Explain about Business Process Outsourcing.	[2M]

PART -B

2.	a)	Define Management. Explain Henry Fayol's Principles of Management.	[7M]
	b)	Explain theory X and theory Y of motivation.	[7M]
3.	a)	What do you mean by Statistical Quality Control? Explain its importance in quality control.	[7M]
	b)	Define work study and explain the need for work study in an enterprise.	[7M]
4.	a)	Explain the concept Job Evaluation. Discuss its significance.	[7M]
	b)	Discuss the different stages in Product Life Cycle.	[7M]
5.	a)	Explain how you determine the probability of meeting the scheduled date of completion of project.	[7M]
	b)	A project consists of 10 activities as detailed below. Draw the network. Identify the critical path and duration of the project.	[7M]

Job	Immediate Predecessors
A	-
B	A
C	A
D	A
E	B
F	C
G	D
H	D
I	E, F, G
J	H, I

6.	a)	Explain various elements of Corporate Planning Process.	[7M]
	b)	Define Environmental Scanning and how is it useful to business organizations?	[7M]
7.	a)	Explain the concept on Total Quality Management.	[7M]
	b)	Describe the process of Six Sigma.	[7M]

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R16

SET - 3

III B. Tech I Semester Regular Examinations, October/November - 2018
MANAGEMENT SCIENCE
(Common to Civil Engineering and Petroleum Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	Explain about Decision Making Process.	[2M]
	b)	Define Economic Order Quantity.	[2M]
	c)	Define the term Marketing.	[2M]
	d)	Explain Project Crashing.	[3M]
	e)	What are genetic Strategies?	[3M]
	f)	What is the importance of balanced Score card?	[2M]

PART -B

2.	a)	Explain Hertzberg's Two Factor Theory of Motivation.	[7M]
	b)	Discuss the various types of organization structures.	[7M]
3.	a)	Explain briefly the scope of operations management.	[7M]
	b)	What methods can be adopted to reduce the inventory costs?	[7M]
4.	a)	Explain different methods of training in an organization.	[7M]
	b)	What do you mean by marketing? Explain various functions of Marketing.	[7M]
5.	a)	Discuss the guidelines for constructing a project network.	[4M]
	b)	Draw the PERT network for the following activities and determine the probability of completing the project in 48 days.	[10M]

Jobs	Optimistic Time	Most likely Time	Pessimistic Time
1-2	5	8	1
1-3	1	3	5
2-4	4	6	7
3-4	3	7	9
4-5	10	20	30
4-6	14	18	23
4-7	3	6	10
5-7	5	9	12
6-8	1	4	6
7-8	2	5	9

6.	a)	Define Vision. Explain the characteristics of a Vision.	[7M]
	b)	Define Strategy. What are steps involved in formulating a strategy?	[7M]
7.	a)	Explain the concept of Just-In-Time.	[7M]
	b)	What is Enterprise Resource Planning (ERP)? Explain the process of ERP?	[7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
MANAGEMENT SCIENCE
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Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	Explain the Principles of organization.	[2M]
	b)	What is R- Chart?	[2M]
	c)	List out the different Training Methods.	[2M]
	d)	Define Project Management.	[3M]
	e)	What do you mean by Strategy Evaluation?	[3M]
	f)	Define Total Quality Management.	[2M]

PART -B

2.	a)	Define Management. Describe functions of Management.	[7M]
	b)	Explain process of Decision Making.	[7M]
3.	a)	Define the term Inventory? Explain the need and importance of Inventory Management in an organization.	[7M]
	b)	Explain the functions of materials manager.	[7M]
4.	a)	Suggest various strategies based on various phases of Product Life Cycle.	[7M]
	b)	Describe various functions of HR Manager.	[7M]
5.	a)	From the activity details given below, determine the optimal project duration and optimal project cost. Indirect Cost is Rs.150 per day.	[10M]

Activity	Normal Time (Days)	Normal Cost (Rs.)	Crash Time (Days)	Crash Cost (Rs.)
1-2	8	200	6	400
1-3	4	300	2	700
2-4	2	100	1	180
2-5	10	200	5	800
3-4	5	200	1	200
4-5	3	160	1	200

	b)	Distinguish between PERT and CPM	[4M]
6.	a)	State the significance of corporate planning.	[7M]
	b)	Explain the role of SWOT analysis in strategy formulation.	[7M]
7.	a)	What is bench marking? How is useful?	[7M]
	b)	Explain the concept Business Process Outsourcing.	[7M]

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R16

SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018
POWER ELECTRONICS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	Draw the turn – OFF characteristics of SCR.	[2M]
	b)	Explain the effect of source inductance in fully controlled bridge rectifier with continuous conduction.	[2M]
	c)	Draw the circuit diagram of a 3-phase full wave uncontrolled rectifier.	[2M]
	d)	Explain duty cycle in step up chopper operation	[3M]
	e)	What is the principle of operation of Inverter?	[3M]
	f)	Compare turn off mechanism of TRIAC and Thyristor	[2M]

PART –B

2.	a)	What is power MOSFET? What are the types of power MOSFET? Write the difference between general purpose MOSFET and power MOSFET?	[7M]
	b)	Describe the basic behavior of thyristor using a two- transistor model.	[7M]
3.		What is phase angle controlled technique? Explain the operation of single – phase angle controlled rectifier. Derive the expression for average dc output voltage. Draw the relevant waveforms.	[14M]
4.		A three –phase full converter is connected to a load resistance of 5 Ω and it is supplied from a 220 V, 50 Hz ac supply, If the firing angle of thyristor is α = 30°, Draw the relevant waveforms and determine i) average output voltage, ii) average output current, iii) rms output voltage and iv) rms output current.	[14M]
5.	a)	Explain the operating principle of dc chopper with a suitable diagram. Draw the voltage and current waveforms of chopper. Derive expressions for average output voltage and rms output voltage.	[10M]
	b)	Discuss the principle of operation of Buck-Boost converter.	[4M]
6.	a)	Describe the V-I characteristics of TRIAC and modes of operation.	[7M]
	b)	A single –phase half –wave ac voltage controller is connected with a load of $R = 5$ Ω with an input voltage of 230 V, 50 Hz. If the firing angle of thyristor is 45° , determine i) RMS output voltage, ii) Power delivered to load	[7M]
7.	a)	What are pulse width modulated inverters? What are the different PWM techniques used in inverter?	[7M]
	b)	With the help of a neat circuit diagram and waveforms, explain the operation of 3-phase bridge inverter with R load.	[7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
POWER ELECTRONICS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1. a) Explain the turn – ON and turn – OFF time of SCR.   [2M]

   b) Draw the 1-phase fully controlled rectifier circuit with freewheeling diode.   [2M]

   c) In the case of a 3-phase , half controlled rectifier feeding a purely resistive load, if two values of the firing angle α are measured from the point of natural commutation are 20 and 40 degrees , then obtain the extinction angles measured from the origin.   [2M]

   d) Draw the static V-I characteristics of TRIAC.   [3M]

   e) List the advantages and disadvantages of Boost converter.   [3M]

   f) Compare VSI and CSI.   [2M]

PART –B

2. a) Draw the V-I characteristics of a power MOSFET and explain different operating regions.   [7M]

   b) Draw the V-I characteristics of SCR and explain it briefly?   [7M]

3. a) A single phase 220 V, 1 kW heater is connected to a half- wave controlled rectifier and fed from a 220 V, 50 Hz ac supply, Determine the power absorbed by the heater when the firing angle is   i) $\alpha = 30^\circ$ and   ii) $\alpha = 90^\circ$.   [10M]

   b) Write the advantage of freewheeling diode in single–phase half –wave controlled rectifier with *RL* load.   [4M]

4. Draw the circuit diagram of three – phase, half –wave controlled rectifier with *R* load and explain its operating principle with voltage and current waveforms. Determine the following parameters for *R* load with firing angle $\alpha = 60^\circ$:
 i) dc output voltage ii) Average dc load current iii) rms output voltage iv) rms load current.   [14M]

5. a) Explain the different control strategies in DC-DC circuits?   [7M]

   b) Discuss the Principle of operation of forward and fly back converters in CCM.   [7M]

6. a) Describe working of 3-Phase AC-AC regulators with R load only and draw the relevant waveforms.   [7M]

   b) A single phase full –wave ac voltage controller is connected with a load of $R = 10 \, \Omega$, with an input voltage of 230 V, 50 Hz. When the firing angle of thyristors is 45°, determine i) power output at load, ii) average value of thyristor current and   iii) rms value of thyristor current.   [7M]

7. a) What is pulse width modulation? List the various PWM techniques. How do these differ from each other?   [7M]

   b) A single-phase PWM inverter is fed from a 220 V dc supply and it is connected to a RL load with R=10 ohms and L=10 mH. Determine the total harmonic distortion in the load current .Assume width of each pulse is π/2 and the output frequency is 50 Hz.   [7M]

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Code No: R1631025 $\quad$ **R16** $\quad$ SET - 3

III B. Tech I Semester Regular Examinations, October/November - 2018
POWER ELECTRONICS
(Electrical and Electronics Engineering)

Time: 3 hours $\hfill$ Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1. a) Compare Power MOSFET and IGBT. [2M]
    b) What would be the input power factor in a 1-phase rectifier if extinction angle control is used for improving power factor with angle β is 50° [2M]
    c) A 3-phase controlled rectifier feeds a purely resistive load. The data are Vs= 220V (rms) and R_{ld} = 15 ohms. If the firing angle α is 45° then what would be the duration of conduction of thyristor. [2M]
    d) Discuss the time ratio control in a dc chopper [3M]
    e) Draw the waveforms for 1-phase fully controlled ac regulator with inductive load. [3M]
    f) Why a PWM inverter is superior to a square wave Inverter? [2M]

PART –B

2. a) Draw the switching characteristics of power MOSFETs. Define turn- ON delay time, rise time, turn – ON time, turn- OFF delay time, fall time and turn- OFF time. [7M]
    b) What are the different turning – ON methods of a thyristor? Explain each method. [7M]

3. a) Draw the circuit diagram of a single – phase full wave controlled rectifier using centre tap transformer with R load and find dc output voltage. [7M]
    b) A single phase fully controlled bridge converter with RL load is supplied from 220 V, 50 Hz ac supply. If the firing angle is 45°, determine i) average output voltage, ii) output current iii) input power factor. [7M]

4. a) Draw the circuit diagram of a three phase bridge converter with *RL* load. Discuss its working principle. Draw the voltage and current waveforms. Determine the following parameters: [14M]
    i) dc output voltage $\quad$ ii) average dc load current iii) rms output voltage
    iv) rms load current .

5. With the help of a neat circuit diagram and associated waveforms, discuss the operation of Buck-Boost converter. [14M]

6. a) Draw the single – phase bidirectional ac voltage controller with *R* load and explain its working principle with waveforms. [7M]
    b) Draw the waveforms for 3-phase a.c voltage regulator for R load for firing angle 60° [7M]

7. Explain the working of TRIAC as voltage controller with R load and draw the relevant waveforms. [14M]

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R16

SET - 4

III B. Tech I Semester Regular Examinations, October/November - 2018
POWER ELECTRONICS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1. a) What is Sunbber circuit? [2M]
    b) In a 1-phase bridge type of controlled rectifier supplying RL load, under what conditions discontinuous conduction occurs. [2M]
    c) Draw a 3-phase half wave controlled converter circuit diagram and output voltage wave form for R load. [2M]
    d) List the advantages and disadvantages of Buck-Boost converter [3M]
    e) How shoot through fault will be prevented in VSI. [3M]
    f) What is meant by integrated cycle control [2M]

PART –B

2. a) What is IGBT? What are the advantages of IGBT over power BJT and power MOSFET? [7M]
    b) Draw the V-I characteristics of a thyristor and explain different operating regions. What is the effect of Gate current on the V-I characteristics of a thyristor? [7M]

3. a) What is the effect of source inductance in single –phase full – wave controlled bridge rectifier with *RL* load? (b) Draw the voltage and current waveforms [10 M]
    b) Explain how a free – wheeling diode improves power factor in a converter. [4M]

4. Draw the circuit diagram of 3 – phase half –wave controlled rectifier with *RL* load and explain its operating principle with voltage and current waveforms. Determine the following parameters for *RL* load with firing angle $\alpha = 30^o$:
    i) dc output voltage ii) Average dc load current iii) rms output voltage iv) rms load current v) Ripple factor [14M]

5. With help of neat circuit diagram and associated waveforms discuss the operation of a Buck converter in continuous conduction mode and discontinuous conduction mode. [14M]

6. Derive the expression for rms output voltage of bidirectional 1-phase ac voltage controller with RL load. And draw the relevant waveforms. [14M]

7. Explain the working of a 1-phase full bridge Inverter with RL load. Draw the relevant output waveforms. [14M]

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R16

III B. Tech I Semester Regular Examinations, October/November - 2018
THERMAL ENGINEERING – II
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
4. Use of Steam Tables and Mollier Chart is allowed.

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PART –A

1. a) What do you understand by 'adiabatic flame temperature'? [2M]
    b) In what circumstances the water tube boilers are used in preference to the fire tube boilers? Give reasons in support of your answer. [2M]
    c) What do you understand by `` degree of under-cooling``? [2M]
    d) What is the effect of blade friction on steam turbine performance? [3M]
    e) Explain the merits and demerits of closed and semi-closed cycle gas turbines. [3M]
    f) Write the advantages and limitations of ram jet engine [2M]

PART -B

2. a) Explain the concept of ``mean temperature of heat addition``. [5M]
    b) In a regenerative cycle the inlet conditions are 40 bar and 400^0C. Steam is bled at 10 bar in regenerative heating. The exit pressure is 0.8 bar. Neglecting pump work, determine the efficiency of the cycle. [9M]

3. a) What are the essentials of a good steam boiler? Estimate the factors which should be considered while selecting a boiler. [6M]
    b) What do you understand by feed check valve? Explain the working of a feed check valve with a neat sketch. [8M]

4. a) Explain the classification and working principle of a nozzle. [6M]
    b) Steam from nozzle enters into a single stage impulse turbine at 300 m/s absolute velocity. The nozzle angle=25^0. The blade rotor mean diameter is 100cm and rotating at a speed of 2000 rpm. Find the blade angles if the axial thrust is zero. Find the power developed when the steam flow rate is 600 kg/min. Take blade velocity coefficient=0.9. [8M]

5. a) Discuss the merits and demerits of surface condensers over jet condensers. [6M]
    b) Show that for maximum diagram efficiency of a reaction turbine the blade-steam speed ratio is equal to cos α, where α is the angle of absolute velocity at inlet. State the assumptions made. [8M]

6. a) Discuss briefly the methods employed for the improvement of thermal efficiency of an open cycle gas turbine plant. [6M]
    b) In a simple gas turbine plant, air enters at 1 bar and 20^0C and compressed with isentropic efficiency of 80% to 4bar. Then it is heated in combustion chamber with A:F ratio=90:1. The Calorific value of a fuel used is 41.8 MJ/kg. If air flow is 3kg/sec, find the power developed and thermal efficiency by the plant. Take C_p= 1kJ/kg ^{0}C and Ɣ=1.4 for air as well as gas. [8M]

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7. a) What do you understand by after burning? Explain. [6M]

   b) A turbojet engine indicates 45 kg of air per second and propels an aircraft with a [8M]
      uniform flight speed of 880 km/h. The isentropic enthalpy change for nozzle is
      188.37 kJ/kg and its velocity coefficient is 0.96. The fuel-air ratio is 0.012, the
      combustion efficiency is 0.95 and the lower heating value of the fuel is 44,000kJ/kg.
      Calculate: i) the thermal efficiency of the engine, ii) the fuel flow rate in kg/h, iii) the
      propulsion power in kW, iv) the thrust power, v) the propulsive efficiency.

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III B. Tech I Semester Regular Examinations, October/November - 2018
THERMAL ENGINEERING – II
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
4. Use of Steam Tables and Mollier Chart is allowed.
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PART –A

1.	a)	Discuss briefly the advantages of a regenerative feed heating in steam power cycle.	[2M]
	b)	Define: equivalent evaporation and boiler efficiency.	[2M]
	c)	Discuss the effects of friction on the flow through a steam nozzle?	[2M]
	d)	What do you understand by degree of reaction?	[2M]
	e)	Draw the T-S diagram of actual gas turbine plant indicating its processes.	[3M]
	f)	What is the importance of specific impulse in rocket performance? What is its unit?	[3M]

PART -B

2.	a)	Describe the various operations of a Rankine cycle. Derive its expression for the thermal efficiency.	[7M]
	b)	Compare the Rankine efficiency of a high pressure plant operating from 80bar and 400^0C and a low pressure plant operating from 40bar and 400^0C, if the condenser pressure in both cases is 0.07bar.	[7M]
3.	a)	What do you understand by Boiler Draught? Discuss its classification in detail.	[6M]
	b)	Explain why the blow-off cock is operated periodically when the boiler is working. Where is it located? Explain its working with a neat sketch.	[8M]
4.	a)	What are the different methods of compounding of steam turbine stages? List the advantages and limitations of velocity compounding.	[6M]
	b)	A convergent-divergent nozzle is required to discharge 2kg of steam per second. The nozzle is supplied with steam at 10bar and 200^0C and the discharge takes place against a back pressure of 0.34bar. Estimate the throat and exit areas. Assume isentropic flow and take the index n=1.3. If the nozzle efficiency is assumed to be 85%, determine the exit area.	[8M]
5.	a)	Describe the factors which influence the efficiency of a condensing plant.	[6M]
	b)	In a reaction turbine, the fixed blades and moving blades are of same shape but reversed in direction. The angles of the receiving tips are 35^0 and of the discharging tips are 20^0. Find the power developed per pair of blades for a steam consumption of 2.5 kg/s, when the blade speed is 50m/s. If the heat drop per pair is 10.04 kJ/kg, find the efficiency of the pair.	[8M]

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6. a) Sketch and explain the line diagram of a semi closed gas turbine plant. [6M]
   b) In gas turbine plant, the compressor takes air at 15^0C and compresses with pressure ratio of 4 with isentropic efficiency 82%. Then the air is heated in the heat exchanger using 75% of the available heat with exhaust gases and then heated in combustion chamber to 600^0C. Isentropic efficiency of turbine is 70%. Taking the properties of air and gases same, find work developed per kg of air flow and thermal efficiency of the cycle; Take effectiveness of heat exchanger as 0.75. [8M]

7. a) With the help of a T-s diagram, explain the air standard cycle for a jet propulsion plant. [5M]
   b) Write short notes on liquid propellant engines. [4M]
   c) What is meant by thrust augmentation? When is it necessary? Describe any one method of thrust augmentation. [5M]

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2 of 2

III B. Tech I Semester Regular Examinations, October/November - 2018
THERMAL ENGINEERING – II
(Mechanical Engineering)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
　　　 2. Answer **ALL** the question in **Part-A**
　　　 3. Answer any **FOUR** Questions from **Part-B**
　　　 4. Use of Steam Tables and Mollier Chart is allowed.
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PART –A

1.	a)	Explain the concept of heat of reaction.	[2M]
	b)	Explain the basic differences between internally fired and externally fired boilers?	[3M]
	c)	Explain what is meant by critical pressure ratio of a nozzle.	[2M]
	d)	State Dalton`s law of partial pressures.	[2M]
	e)	Discuss the advantages and disadvantages of a closed cycle gas turbine over open cycle gas turbine?	[3M]
	f)	Classify jet propulsion systems	[2M]

PART -B

2.	a)	Explain Regenerative Rankine cycle and discuss its advantages and disadvantages of over Simple Rankine cycle.	[6M]
	b)	A steam power plant operates on a theoretical reheat cycle. Steam at boiler at 150bar, 550^0C expands through the high pressure turbine. It is reheated at a constant pressure of 40bar to 550^0C and expands through the low pressure turbine to a condenser at 0.1bar. Draw T-s and h-s diagrams. Find: i) find quality of steam at turbine exhaust; ii) cycle efficiency; iii) steam rate in kg/kWh.	[8M]
3.	a)	Explain the advantages gained by using forced circulation over natural circulation in high pressure boilers.	[6M]
	b)	A steam generator evaporates 1800 kg/h of steam at 12.5 bar and a quality of 0.97 from feed water at 105^0C, when coal is fired at the rate of 2040 kg/h. If the higher calorific value of the coal is 27400 kJ/kg, find i) Equivalent Evaporation and　 ii) Thermal Efficiency.	[8M]
4.	a)	Write the general energy equation for a steady flow system and from this obtain the energy equation for nozzle. State clearly the assumptions made.	[6M]
	b)	Dry saturated steam at 10bar is expanded in a nozzle to 0.4 bar. The throat area is 7cm and the inlet velocity is negligible. Estimate the mass flow and the exit area. Assume isentropic flow and take the index n=1.135 for dry saturated steam.	[8M]
5.	a)	What is the fundamental difference between the operation of impulse and reaction turbines? Explain the same with neat sketches.	[6M]
	b)	A stage of impulse-reaction turbine is provided with single row wheel whose mean diameter is 100cm and it is rotating at 50 rps. The nozzle angle=20^0 and the velocity of steam coming out of the turbine is 350 m/sec. Determine the power developed if the axial thrust on the end bearings is limited to 118N. Take blade friction factor=0.8. Assume the blades are equi-angular.	[8M]

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6. a) Discuss the effect of Compressor inlet temperature and Turbine isentropic efficiency on the specific output and thermal efficiency of the open cycle gas turbine at different pressure ratios. [6M]

   b) In a open cycle gas turbine plant, air enters at 1 bar, 20^0C and compressed to 5 bar. Taking the maximum temperature of the cycle as 680^0C, compressor, turbine and combustion efficiencies as 85%, 80% and 85% respectively, pressure loss in the combustion chamber as 0.1 bar, specific heat (Cp) as 1.02 kJ/kg.K and $Y=1.4$ for air and gas. Find the [8M]
   i) Air circulation if power developed by the plant is 1065 kW;
   ii) Thermal efficiency of the cycle. Neglect the mass of the fuel.

7. a) Describe with a sketch a solid propellant rocket. What is gain? What are the applications of solid propellant rockets? [6M]

   b) A turbo jet engine consumes air at the rate of 60 kg/s when flying at a speed of1000 km/h. calculate: [8M]
   i) Exit velocity of the jet when the enthalpy change for the nozzle is 230 kJ/kg and velocity coefficient is 0.96.
   ii) Fuel flow rate in kg/s when air – fuel ratio is 70 : 1.
   iii) Thrust specific fuel consumption.
   iv) Thermal efficiency of the plant when the combustion efficiency is 90% and calorific value is 40000 kJ/kg.
   v) Propulsive power
   vi)propulsive efficiency
   vii) overall efficiency.

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2 of 2

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III B. Tech I Semester Regular Examinations, October/November - 2018
THERMAL ENGINEERING – II
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
4. Use of Steam Tables and Mollier Chart is allowed.
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PART –A

1.	a)	What do understand by stoichiometric air-fuel ratio? Explain.	[2M]
	b)	Explain the difference between induced and forced draught.	[2M]
	c)	Discuss the principle of operation of steam turbines?	[2M]
	d)	Discuss about the factors which affect the vacuum efficiency of a condenser.	[3M]
	e)	Write the merits of closed cycle gas turbine over open cycle gas turbine.	[3M]
	f)	Define thrust power and propulsion efficiency of a rocket engine.	[2M]

PART -B

2. a) Discuss the advantage of reheating the steam in high pressure steam plants. [6M]

   b) In a regenerative cycle, the steam pressure at turbine inlet is 30bar and the exhaust [8M]
   is at 0.04bar. The steam is initially saturated. Enough steam is bled off at the
   optimum pressure to heat the feed water. Determine the cycle efficiency. Neglect
   pump work.

3. a) Why mountings are essential in boilers? Name different mountings and give [6M]
   functions of each.

   b) Obtain the expression for draught in mm column of water when the discharge is [8M]
   maximum?

4. a) Explain the working of a single-stage impulse turbine. Sketch pressure and velocity [6M]
   variations along the axis of the turbine.

   b) Derive an expression for maximum mass flow through a convergent-divergent [8M]
   nozzle when the steam is expanded isentropic ally from rest.

5. a) Briefly state the effects of air leakage on the performance of a condenser. [6M]

   b) In a reaction turbine, the blade tips are inclined at 35^0 and 20^0 in the direction of [8M]
   motion. The guide blades are of same shape as that of the moving blades, but
   reversed in direction. At a certain place in the turbine, the drum diameter is 1m and
   the blades are 10 cm high. At this place, the steam has a pressure of 1.75 bar and
   dryness fraction of 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.

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6. a) What problems are encountered in the design of gas turbine combustion chambers? Draw a neat sketch of a combustion chamber used for an open-cycle plant and name the parts. [7M]

   b) Derive the expression of optimum pressure ratio for maximum net work output in an ideal gas turbine cycle. [7M]

7. a) What is a rocket engine? Explain how is it propelled? [5M]

   b) The following data pertain to a turbo jet flying at an altitude of 9000m: [9M]
   Speed of the jet = 800 km/h
   Propulsive efficiency = 55%
   Overall efficiency = 17%
   Density of air at 9000 m = 0.17 kg/m^3
   Drag on the plane = 6100 N
   Calorific value of the fuel used is 4500 kJ/kg,
   Calculate: i) Absolute velocity of the jet, ii) Volume of air compressed per min,
   iii) Diameter of the jet, iv) power output of the unit, v Air – fuel ratio.

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R16

III B. Tech I Semester Regular Examinations, October/November - 2018
ANTENNA AND WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
      2. Answer **ALL** the question in **Part-A**
      3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	Define polarization.	[2M]
	b)	Define radiation resistance.	[2M]
	c)	List out the different controls that can be used to shape the overall pattern of antenna array.	[2M]
	d)	Write short notes on characteristic impedance of patch antenna.	[3M]
	e)	Draw the geometrical configuration of plane reflector and corner reflector.	[2M]
	f)	Write short notes on Maximum Usable Frequency.	[3M]

PART -B

2.	a)	Explain the radiation mechanism in short dipole.	[7M]
	b)	Explain the following: (i) Main lobes and side lobes (ii) Beamwidth	[7M]
3.	a)	What is meant by retarded potentials? Explain.	[7M]
	b)	State reciprocity theorem and explain its use in antennas.	[7M]
4.	a)	Derive the expression for array factor of two-element array.	[7M]
	b)	Explain about Broad side array.	[7M]
5.	a)	Write the features of travelling wave antennas.	[7M]
	b)	Explain the design procedure of rectangular patch antenna.	[7M]
6.	a)	Explain the basic principle of lens antenna and write the applications of lens antenna.	[7M]
	b)	Draw the set-up for pattern measurements and explain it.	[7M]
7.	a)	Explain about tropospheric scattering.	[7M]
	b)	Explain about ionospheric abnormalities.	[7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
ANTENNA AND WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	Define Gain and Resolution of an antenna.	[2M]
	b)	Write the applications of loop antenna.	[3M]
	c)	What is a uniform linear array?	[2M]
	d)	Write the applications of helical antenna.	[3M]
	e)	What is delay lens and fast lens?	[2M]
	f)	Define Skip distance.	[2M]

PART -B

2.	a)	Explain current distribution on linear dipoles.	[7M]
	b)	Explain about field regions of an antenna.	[7M]
3.		Explain about Radiation from a Quarter-wave monopole.	[14M]
4.	a)	Explain the concept of principle of pattern multiplication.	[7M]
	b)	Explain the concept of scanning arrays.	[7M]
5.	a)	Define microstrip antenna. Write its advantages and applications of it.	[7M]
	b)	What is an Inverted V antenna? Write its features.	[7M]
6.	a)	Explain the cassegrain feed system in parabolic reflector.	[7M]
	b)	Explain the Gain measurement by three antenna method.	[7M]
7.	a)	Explain the mechanism of ionospheric propagation.	[7M]
	b)	What is meant by Duct propagation? Explain.	[7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
ANTENNA AND WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
           2. Answer **ALL** the question in **Part-A**
           3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	What is meant by beam efficiency?	[2M]
	b)	An antenna whose radiation resistance is 300 Ω operates at a frequency of 1 GHz and with a current of 3 amperes. Find the radiated power.	[2M]
	c)	Define First Side Lobe Ratio.	[2M]
	d)	What are the drawbacks of patch antennas?	[2M]
	e)	Write the applications of Horn antenna.	[3M]
	f)	Write short notes on Radio Horizon.	[3M]

PART -B

2.	a)	Explain current distribution on a lossless two-wire transmission line, flared transmission line and linear dipole.	[7M]
	b)	Explain about radiation intensity of an antenna.	[7M]
3.		Explain about Radiation from a half-wave dipole.	[14M]
4.	a)	Derive the expression for field strength of a uniform linear array.	[7M]
	b)	Write the characteristics of Yagi-Uda arrays.	[7M]
5.	a)	Explain the operation of helical antenna in normal mode.	[7M]
	b)	What is Rhombic antenna? Write the salient features of it.	[7M]
6.	a)	Explain the operation of parabolic reflector.	[7M]
	b)	Explain the procedure for measurement of directivity.	[7M]
7.	a)	Derive the expression for field strength due to space wave.	[7M]
	b)	Write the salient features of ground wave propagation.	[7M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
ANTENNA AND WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
         2. Answer **ALL** the question in **Part-A**
         3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Define Directivity of an antenna. [2M]

   b) What is far field of an antenna? [2M]

   c) What is binomial array? [2M]

   d) List out the different shapes of patch antennas. [2M]

   e) Draw the geometry of parabolic reflector in transmitting mode and receiving mode. [3M]

   f) What is meant by Ground wave? Explain. [3M]

PART -B

2. a) Explain about radiation mechanism in a single wire. [7M]

   b) Discuss about linear, circular and elliptical polarizations. [7M]

3. a) Explain about radiation power and radiation resistance of current element. [7M]

   b) Define effective area and explain its significance [7M]

4. a) Explain about ordinary End fire array. [7M]

   b) Explain about Folded dipoles and write its characteristics. [7M]

5. a) Explain the operation of helical antenna in axial mode. [7M]

   b) What is V antenna? Write the salient features of it. [7M]

6. a) Write the salient features of corner reflector antenna. [7M]

   b) Find the power gain and directivity of a horn whose dimensions are 10 x 5 cm operating at a frequency of 6 GHz. [7M]

7. a) What is meant by wave tilt? Explain. [7M]

   b) Explain the effect of curvature of the earth on space wave propagation. [7M]

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R16

SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018
OPERATING SYSTEMS
(**Common to** Computer Science Engineering, Information Technology)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	List out the services provided by an operating system.	[2M]
	b)	List Fields of Process Control Block.	[2M]
	c)	What is Virtual Address Space?	[2M]
	d)	What is Resource-Allocation-Graph.	[3M]
	e)	What are the two ways of accessing disk storage?	[3M]
	f)	What is an Activity Stack in Android?	[2M]

PART -B

2.   With a neat sketch, Explain in detail about the interrelation between various services provided by the operating system.   [14M]

3. a)   Explain in detail, the sequence of actions taken by the operating system to context switch between processes.   [6M]

   b)   Assume the following workload in a system. All jobs arrive at time 0 in the order given.   [8M]

Process	Burst Time	Priority
P1	30	High
P2	28	High
P3	04	Low
P4	16	Medium

Draw a Gantt chart illustrating the execution of these jobs using Priority CPU scheduling algorithm and also Calculate the average waiting time and average turnaround time.

4. a)   What is a page fault? Explain the steps involved in handling a page fault with a neat sketch.   [7M]

   b)   Explain the process of converting virtual addresses to physical addresses with a neat diagram.   [7M]

5. a)   What is a Critical Section problem? Give the conditions that a solution to the critical section problem must satisfy.   [7M]

   b)   What is a deadlock? How deadlocks are detected?   [7M]

6. a)   Briefly explain about single-level, two-level and Tree-Structured directories.   [6M]

   b)   Consider a disk queue with following requests for I/O to blocks on cylinders 30,70,115,130.110,80,20,25   (Assume disk head is at 90)
   Draw FCFS and SSTF scheduling and also determine how many times the disk head changes its direction for each of the above mentioned scheduling techniques.   [8M]

7. a)   Discuss the advantages and several disadvantages of open-source Operating systems.   [6M]

   b)   Discuss in detail about Android Runtime Application Development.   [8M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
OPERATING SYSTEMS
(**Common to** Computer Science Engineering, Information Technology)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
        2. Answer **ALL** the question in **Part-A**
        3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	List out the types of System calls.	[3M]
	b)	What is Multi-Threading?	[2M]
	c)	What is the Cause of Thrashing?	[2M]
	d)	What is Process Synchronization?	[3M]
	e)	What is a device driver	[2M]
	f)	What is the Dalvik Virtual machine in Android?	[2M]

PART -B

2.	a)	Discuss various operating system services that are very much helpful to the user.	[7M]
	b)	What are the advantages and disadvantages of using the same system call interface for manipulating both files and devices?	[7M]
3.	a)	With a neat diagram, explain the process state diagram.	[6M]
	b)	What are the advantages of inter-process communication? How communication takes place in a shared-memory environment? Explain.	[8M]
4.	a)	How demand paging affects the performance of a computer system? Give explanation.	[7M]
	b)	How does the system detect Thrashing? What can the system do to eliminate this problem? Explain.	[7M]
5.	a)	What happens if the wait() and signal() semaphore operations are not executed atomically? Give explanation.	[7M]
	b)	What is Dining Philosophers problem? Discuss the solution to Dining philosopher's problem using monitors.	[7M]
6.	a)	Discuss various file access methods in detail.	[7M]
	b)	Explain about various issues involved in selecting appropriate disk scheduling algorithm.	[7M]
7.		Explain each and every component of the Android architecture with a neat sketch.	[14M]

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III B. Tech I Semester Regular Examinations, October/November - 2018
OPERATING SYSTEMS
(**Common to** Computer Science Engineering, Information Technology)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	Define Operating System.	[2M]
	b)	What is Process control block?	[3M]
	c)	Differentiate between Logical and Physical address space.	[3M]
	d)	State the Critical Section problem.	[2M]
	e)	What are the most common attributes that are associated with an opened file?	[2M]
	f)	What is aninode in LINUX?	[2M]

PART -B

2.   a) Explain the objectives and functions of Operating system. [7M]
      b) Explain in detail about the functions of System Call Interface. [7M]

3.   a) Explain the process scheduling with a neat queuing diagram. [7M]
      b) Assume the following workload in a system. All jobs arrive at time 0 in the order given. [7M]

Process	Burst Time	Order
P1	4	1
P2	5	2
P3	3	3

Draw a Gantt chart illustrating the execution of these jobs using Round Robin CPU scheduling algorithm (Assume time quantum= 1 unit) and also Calculate the average waiting time and average turnaround time.

4.   a) Explain the difference between External fragmentation and Internal fragmentation. How to solve the fragmentation problem using paging. [7M]
      b) Consider the following page reference string: [7M]
1,2,4,7,3,5,6,3,6,1,4,2,3,6,5,2
How many page faults would occur for the optimal page replacement algorithm, assuming four frames and all frames are initially empty.

5.   a) Discuss Mutual-exclusion implementation with Test And Set () instruction. [7M]
      b) Discuss various techniques to recover from the deadlock. [7M]

6.   a) Explain in detail about various ways of accessing disk storage. [4M]
      b) Explain the various methods for free-space management. [10M]

7.   a) How Interrupts and Exceptions are handled in LINUX? Explain. [7M]
      b) Explain about the process lifecycle in Android. [7M]

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R16

III B. Tech I Semester Regular Examinations, October/November - 2018
OPERATING SYSTEMS
(**Common to** Computer Science Engineering, Information Technology)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
       2. Answer **ALL** the question in **Part-A**
       3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1.	a)	Draw the Layered structure of Operating system.	[2M]
	b)	When a process creates a new process, what is shared between parent process and child process?	[2M]
	c)	List the disadvantages of single contiguous memory allocation.	[2M]
	d)	What is Counting semaphore.	[3M]
	e)	Write about Master File Directory in two-level directory structure.	[2M]
	f)	What are Synchronous and Asynchronous interrupts in LINUX.	[3M]

PART -B

2.	a)	Discuss various challenges and issues that are to be considered while designing an operating system.	[5M]
	b)	Why Real time operating systems are needed? Give some examples.	[4M]
	c)	Write the difference between the function and system call. Briefly explain the six major categories of system calls.	[5M]
3.	a)	Explain in detail the two popular inter-process communication mechanisms.	[7M]
	b)	What are the criteria for evaluating the CPU scheduling algorithms? Why do we need it?	[7M]
4.	a)	Discuss various issued related to the allocation of frames to processes.	[7M]
	b)	Consider the following page reference string: 1,2,4,7,3,5,6,3,6,1,4,2,3,6,5,2 How many page faults would occur for the LRU page replacement algorithm, assuming four frames and all frames are initially empty.	[7M]
5.	a)	How does the signal() operation associated with monitors differ from the corresponding operation defined for semaphores.	[7M]
	b)	Explain the various ways of aborting a process in order to eliminate deadlocks.	[7M]
6.	a)	Explain the Indexed allocation of disk space.	[7M]
	b)	Compare the SCAN and C-SCAN disk scheduling algorithms with an example.	[7M]
7.	a)	Explain about the key Components of a LINUX system.	[7M]
	b)	What is Android? Is Android Open-Source? Discuss the features of Android.	[7M]

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Code No: RT31016

(R13)

(SET - 1)

III B. Tech I Semester Supplementary Examinations, October/November-2018
INTELLECTUAL PROPERTY RIGHTS AND PATENTS
(Common to Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering,
Electronics and Communication Engineering, Electronics and Instrumentation Engineering,
Aeronautical Engineering, Automobile Engineering and Agricultural Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
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PART –A

1	a)	Write about Patent Cooperation Treaty.	[3M]
	b)	Explain Employee Confidentiality Agreement to safeguard Trade secrets.	[4M]
	c)	Write about Lay out design for a semiconductor.	[3M]
	d)	Explain Assignment of Copyright.	[4M]
	e)	Explain about Patent Addition.	[4M]
	f)	Write about 'Fair use' of copyright material.	[4M]

PART -B

2	a)	Write about the Complete Specifications of a Patent Application.	[4M]
	b)	Explain different periods of duration for different subject matters of copy right	[8M]
	c)	Write about Intellectual Property Appellate Board	[4M]
3	a)	What is E - Commerce?	[3M]
	b)	What is trade secret and how it can be protected under the law?	[8M]
	c)	What is infringement of trademark?	[5M]
4	a)	Write about the significance of Digital signatures under the information technology Act, 2000.	[8M]
	b)	Explain the registration process of Trademark?	[8M]
5	a)	What are the remedies for the misuse of monopoly under the exclusive rights of a patentee?	[8M]
	b)	Explain the evolution of IP regime in India.	[8M]
6	a)	What is copyright infringement? What are the remedies for it?	[8M]
	b)	Who is a performer? Explain his rights.	[8M]
7	a)	Write about the purpose of publications, pre grant and post grant oppositions of a patent application.	[8M]
	b)	What are the exceptions to Copyright Infringement?	[8M]

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III B.Tech I Semester Supplementary Examinations, October/November - 2018
FINITE ELEMENT METHODS
(Common to Mechanical Engineering and Automobile Engineering)

Time: 3 hours   Max. Marks: 75

Answer any FIVE Questions
All Questions carry equal marks
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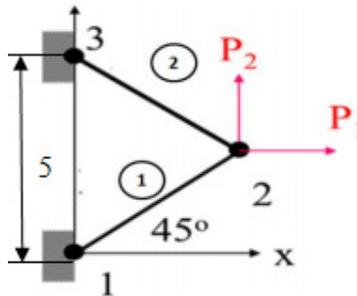|		
1	Explain the following methods used for the formulation of element characteristics and load matrices. i) Variational approach ii) Weighted residual approach	[15M]
2 a)	Explain the following methods for treatment of boundary conditions in FEM (i)Elimination approach (ii) Penalty approach.	[8M]
b)	Mention the various coordinates in FEM. Explain any one.	[7M]
3	For the two-bar truss shown in Fig.1, determine the nodal displacements, and element stresses. The length of bars 12 and 23 are equal (L), E: Young's modulus and A:Cross sectional area of each bar.	[15M]

Fig.1

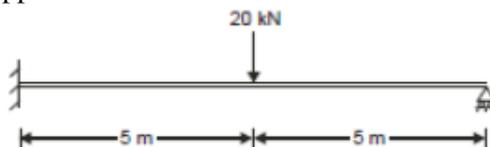|		
4	A beam fig.2 of length 10m, fixed at one end and supported by a roller at the other end carries a 20KN concentrated load at the centre of the span. By taking the modulus of elasticity of material as 200 GPa and moment of inertia as $24 \times 10^{-6}\,\text{m}^4$, determine: i) Deflection under load ii) Shear force and bending moment at mid span iii) Reactions at supports	[15M]

Fig.2

1 of 2

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5 Explain the derivation of stiffness matrix, body force and surface forces for axi-symmetry element [15M]

6 a) Compare Super parametric and isoperimetric representations of triangular element. [8M]

   b) Explain one point formula in numerical integration. [7M]

7 Find the temperature distribution in a straight fin with the physical properties as shown in Fig.3. Thermal conductivity k=70W/cm^{o}C, convention heat transfer coefficient h=10W/cm^{2o}C. Temperature at the root of the fin T_0 =140° C, surrounding temperature T (infinite)= 40° C. Assume that the free end of the fin is insulated. (Consider two elements) [15M]

T_∞ =40^{0}C, h=5 W/cm^2 ^{0}C
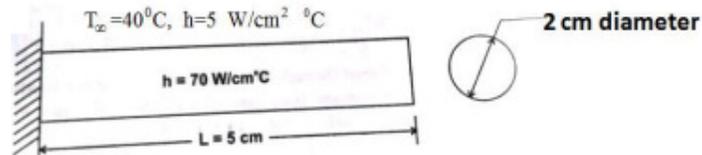
h = 70 W/cm^{o}C

2 cm diameter

L = 5 cm

Fig.3

8 a) Explain the element consistent and lumped mass matrices for one and two dimensional linear elements. [8M]

   b) What is meant by a mode in dynamic analysis? Explain with an example [7M]

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