Code No: R1631015 **R16** SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018

TRANSPORTATION ENGINEERING – II

(Civil 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 are components of Permanent Way?	[2M]
	b)	How various Gauges are different from each other?	[2M]
	c)	What are various surveys that are conducted for railway alignment?	[2M]
	d)	Draw a general layout of Airport Layout	[3M]
	e)	What are various design factors of Runway?	[3M]
	f)	How ports are classified?	[2M]

PART -B

2.	a)	What are the functions of Rails and Sleepers?	[7M]
	b)	Write about Creep theory of Rails.	[7M]
3.	a)	What are factors to be considered for selection of Railway Alignment?	[7M]
	b)	Write about Vertical Curves of Railway Network.	[7M]
4.	a)	What is the purpose of Turnout? Give various types with neat diagram.	[7M]
	b)	What are the objectives of Signaling in Railways?	[7M]
5.	a)	Ministry of Civil Aviation is planning an International Airport at one City. How various factors affect site selection of Airport?	[7M]
	b)	AAI is redesigning lighting system at an existing Airport. Discuss about standards of Airport lighting.	[7M]
6.	a)	Discuss about design methods of flexible pavements of Runway.	[7M]
	b)	Write about maintenance of Airfield Pavement.	[7M]
7.	a)	Government is planning a Good Port at one Sea Shore. What are the requirements of good Port explain it to Port In-charge?	[7M]
	b)	Compare Dry and Wet Dock.	[7M]

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Code No: R1631015 **R16** SET - 2

III B. Tech I Semester Regular Examinations, October/November - 2018

TRANSPORTATION ENGINEERING – II

(Civil 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 Permanent Way?	[2M]
	b)	List various Gauges of Railway Track.	[2M]
	c)	What are various alignments of Railway Track?	[2M]
	d)	What is Wind rose diagram?	[3M]
	e)	What are different methods of flexible pavement of Runway?	[3M]
	f)	Differentiate between Dry and Wet Dock.	[2M]

PART -B

2.	a)	What are the requirements and functions of Ballast?	[7M]
	b)	Explain about Rail Joints.	[7M]
3.	a)	What are various Gradients in Railways? Explain Grade Compensation.	[7M]
	b)	Explain widening of Gauge at Curves.	[7M]
4.	a)	Write about various components of Turnout.	[7M]
	b)	Discuss about classification of Signaling in Railways.	[7M]
5.	a)	Write about characteristics of Aircraft.	[7M]
	b)	What are the corrections to be adopted for Runway length? Discuss.	[7M]
6.	a)	Explain about design factors of Runway Pavement.	[7M]
	b)	How drainage is designed for Runway?	[7M]
7.	a)	What are the uses of Transition Shed in Port?	[7M]
	b)	Write about Break waters.	[7M]

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Code No: R1631015 **R16** SET - 3

III B. Tech I Semester Regular Examinations, October/November - 2018

TRANSPORTATION ENGINEERING – II

(Civil 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 a neat diagram of Permanent Way.	[2M]
	b)	What is Gauge?	[2M]
	c)	List various Gradients in Railways.	[2M]
	d)	How the direction of a Runway is fixed?	[3M]
	e)	What are different methods of rigid pavement of Runway?	[3M]
	f)	What is the purpose of Warehouse?	[2M]

PART -B

2.	a)	What are the components of Permanent Way? Explain.	[7M]
	b)	Write about Rail fastenings?	[7M]
3.	a)	Define Cant. What are the objectives of it?	[7M]
	b)	Write about widening of Gauge on Curves.	[7M]
4.	a)	Discuss about various types of Switches.	[7M]
	b)	Explain about Mechanical Signaling System.	[7M]
5.	a)	How Airports are classified based on various aspects?	[7M]
	b)	Write about standards Airport Markings.	[7M]
6.	a)	A flexible pavement is planned at a New Airport for Runway. How Runway pavement is designed?	[7M]
	b)	What is the process of strengthening of Airfield Pavement?	[7M]
7.	a)	Describe the construction process of Quay wall.	[7M]
	b)	Write about Tides data and Analysis.	[7M]

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Code No: R1631015 **R16** SET - 4

III B. Tech I Semester Regular Examinations, October/November - 2018

TRANSPORTATION ENGINEERING – II

(Civil 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)	List Permanent Way components.	[2M]
	b)	Give two uses of Uni-Gauge Policy.	[2M]
	c)	What is Degree of Curve?	[2M]
	d)	How Airports are classified?	[3M]
	e)	What are the main points to considered for Airport Drainage?	[3M]
	f)	Draw a neat diagram of Break Water.	[2M]

PART -B

2.	a)	What are various types of Gauges of Railway network? Explain.	[7M]
	b)	Write about Sleeper Density.	[7M]
3.	a)	Calculate Cant for BG Track, 2^0 Curve, equilibrium speed 80Kmph.	[7M]
	b)	Define Transition Curve. Write about purpose and requirements of it.	[7M]
4.	a)	How Turnout is designed?	[7M]
	b)	Write about methods of interlocking.	[7M]
5.	a)	Explain about ICAO recommendations of Airport Master Plan.	[7M]
	b)	What are the requirements of Air Traffic Control?	[7M]
6.	a)	Discuss about LCN system of Pavement design for Runway.	[7M]
	b)	How Airfield Pavements are evaluated?	[7M]
7.	a)	You are appointed as an Engineer in a Port. Explain the importance of Dredging to the workers in that Port?	[7M]
	b)	How do you help (aid) the ship to follow a particular path in Sea?	[7M]

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Code No: R1631024 **R16** SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018

PULSE AND DIGITAL CIRCUITS

(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 meant by linear wave shaping?	[2M]
	b)	Write the difference between comparator and clipping circuit.	[2M]
	c)	Write short notes on piece-wise linear diode characteristics.	[3M]
	d)	What is meant by quasi stable state?	[2M]
	e)	What is meant by sweep time and restoration time?	[3M]
	f)	What is Pedestal? Explain.	[2M]

PART -B

2.	a)	A square wave whose peak to peak amplitude is 2 V extends ± 1 V with respect to ground. The duration of the positive section is 0.1 s and that of the negative section is 0.2 s. if this waveform is impressed upon an RC integrating circuit whose time constant is 0.2 s, what are the steady-state maximum and minimum values of the output waveform?	[7M]
	b)	Explain the response of High-pass RC circuit for square wave input.	[7M]
3.	a)	Draw the circuit diagram of emitter coupled clipper and explain its operation.	[7M]
	b)	Design a diode clamper circuit to clamp the positive peaks of the input signal at zero level. The frequency of the input voltage is 750 Hz.	[7M]
4.	a)	Explain about diode forward recovery time and reverse recovery time.	[7M]
	b)	Silicon transistors with h_{FE} (min) = 20 are available. If $V_{CC} = V_{BB} = 10$ V, design the bistable multivibrator.	[7M]
5.	a)	Design a collector coupled one shot with a gate width of 3 ms, using n-p-n transistors.	[7M]
	b)	Draw the circuit diagram of collector coupled astable multivibrator and derive the expression for frequency of oscillations.	[7M]
6.	a)	Draw the exponential sweep circuit and derive the expression for transmission error.	[7M]
	b)	Explain the basic principles behind Bootstrap time base generator.	[7M]
7.	a)	Draw the circuit diagram of two input Diode OR gate and explain it.	[7M]
	b)	Explain the operation of six diode sampling gate.	[7M]

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Code No: R1631024 **R16** SET - 2

III B. Tech I Semester Regular Examinations, October/November - 2018

PULSE AND DIGITAL CIRCUITS

(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 an attenuator?	[2M]
	b)	What is meant by positive clamping and negative clamping?	[2M]
	c)	Write the applications of Schmitt trigger.	[3M]
	d)	Define astable multivibrator.	[2M]
	e)	Define transmission error.	[2M]
	f)	Why sampling gates are called linear gates?	[3M]

PART -B

2.	a)	A pulse is applied to low-pass RC circuit. Prove that area under the pulse is same as area under the output waveform across the capacitor.	[7M]
	b)	Explain the response of High-pass RC circuit for step input.	[7M]
3.	a)	Explain clipping at two independent levels using diodes.	[7M]
	b)	State and explain clamping circuit theorem.	[7M]
4.	a)	Discuss about breakdown voltages of a transistor.	[7M]
	b)	Design a bistable multivibrator to meet the following specifications: $V_{CC} = V_{BB} = 12$ V, $I_C(sat) = 6$ mA, h_{FE} (min) = 25 and maximum triggering frequency = 25 kHz.	[7M]
5.	a)	Derive the expression for gate width of a monostable multivibrator neglecting the reverse saturation current I_{CBO}.	[7M]
	b)	Find the ratio V_{CC} / V , if a voltage to frequency convertor generates oscillations of frequency twice of that when $V = V_{CC}$.	[7M]
6.	a)	What is meant by time base signal? What are the general features of time base signal? Explain.	[7M]
	b)	Explain about transistor miller time base generator.	[7M]
7.	a)	Give the comparison of various logic families.	[7M]
	b)	Discuss about reduction of pedestal in sampling gates.	[7M]

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Code No: R1631024 **R16** SET - 3

III B. Tech I Semester Regular Examinations, October/November - 2018

PULSE AND DIGITAL CIRCUITS

(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)	When does high pass circuit act as a differentiator?	[2M]
	b)	What is the difference between clipping and clamping?	[2M]
	c)	Define delay time and storage time.	[2M]
	d)	Find the period of output and the frequency of oscillation of an astable multivibrator with $R_1 = R_2 = 25\ k\Omega$ and $C_1 = C_2 = 0.2\ \mu F$.	[3M]
	e)	Define displacement error.	[2M]
	f)	Write the difference between sampling gate and logic gate.	[3M]

PART -B

2.	a)	Explain the response of Low-pass RC circuit for exponential input.	[7M]
	b)	Draw the circuit diagram of compensated attenuator and explain it.	[7M]
3.	a)	Draw the circuit of transistor clipper and explain its operation.	[7M]
	b)	Design a diode clamper to restore a dc level of +5 V to an input signal of peak-to-peak value 15 V. Assume the drop across the diode is 0.7 V and the signal frequency is 1 kHz.	[7M]
4.	a)	Explain about design of transistor switch.	[7M]
	b)	Explain the operation of Schmitt trigger.	[7M]
5.	a)	Draw the circuit diagram of collector coupled mono stable multivibrator and explain its operation.	[7M]
	b)	Design an astable multivibrator to generate a square wave of 1 kHz.	[7M]
6.	a)	Explain the basic principles behind miller time base generator.	[7M]
	b)	Discuss about the transistor bootstrap time base generator.	[7M]
7.	a)	Draw the diode logic AND circuit and explain it.	[7M]
	b)	Explain the operation of four diode sampling gate.	[7M]

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Code No: R1631024 **R16** SET - 4

III B. Tech I Semester Regular Examinations, October/November - 2018

PULSE AND DIGITAL CIRCUITS

(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)	Define the term 'rise time'.	[2M]
	b)	List out the some applications of voltage comparator.	[3M]
	c)	What is meant by triggering of binary circuit?	[2M]
	d)	Why monostable multivibrator also called gating circuit?	[2M]
	e)	What is meant by voltage time base generator?	[2M]
	f)	Write the some applications of sampling gates.	[3M]

PART -B

2.	a)	Explain the response of High-pass RC circuit for sinusoidal input.	[7M]
	b)	Explain the response of series RLC circuit for step input.	[7M]
3.	a)	Draw the basic circuit of diode clipper and explain its operation with the help of transfer characteristics.	[7M]
	b)	Explain the operation of negative clamping circuit.	[7M]
4.	a)	For a common emitter circuit, V_{CC} = 15 V, R_C = 1.5 kΩ and I_B = 0.3 mA. (i) Determine the h_{FE}(min) for the saturation to occur. (ii) If the R_C is changed to 500 Ω , will the transistor be saturated?	[7M]
	b)	Design a Schmitt trigger circuit to have V_{CC} = 12 V, UTP = 6 V, LTP = 3 V, using silicon transistors with h_{FE} (min) = 60.	[7M]
5.	a)	Calculate the component values of a monostable multivibrator developing an output pulse of 500 µs duration. Assume h_{FE}(min) = 25, I_{CE}(sat) = 5 mA, V_{CC} = 10 V, and V_{BB} = -4V.	[7M]
	b)	Explain how an astable multivibrator can be used as a voltage to frequency convertor.	[7M]
6.	a)	With necessary waveforms, explain the operation of UJT Relaxation oscillator.	[7M]
	b)	What are the different methods to generate time base waveforms? Explain.	[7M]
7.	a)	Draw the circuit diagram of TTL NAND gate and explain it.	[7M]
	b)	Explain the basic principle behind sampling gate.	[7M]

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Code No: R1631031 **R16** SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018

DYNAMICS OF MACHINERY

(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**

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PART –A

1. a) What is the effect of gyroscopic couple when a ship is rolling? [2M]
   b) Define the terms: Coefficient of friction and Limiting angle of friction. [2M]
   c) Explain clearly how the functions of fly wheel and governor differ from each other. [2M]
   d) What is Controlling Force? [3M]
   e) Explain dynamic balancing. [3M]
   f) What is meant by critical speed of a shaft? [2M]

PART -B

2. A four wheeled trolley car has a total mass of 3000 kg. Each axle with its two wheels and gears has a total moment of inertia of 32 kg.m^2.Each wheel is 500 mm radius. The center distance between the two wheels on an axle is 1.5 m. Each axle is driven by a motor with a speed ratio of 1.3 each motor along with its gear has a moment of inertia of 20 kg.m^2 and rotates in the opposite direction to that of the axle. The center of mass of the car is 1.2 m above rails. Calculate the limiting speed of the car when it has to travel around a curve of 275 m radius without the wheels leaving rails. [14M]

3. a) A band brake shown in Fig.1 uses a V-belt. The pitch diameter of the V-grooved pulley is 400mm. The groove angle is 45° and the coefficient of friction is 0.3. Determine the power rating. [10M]

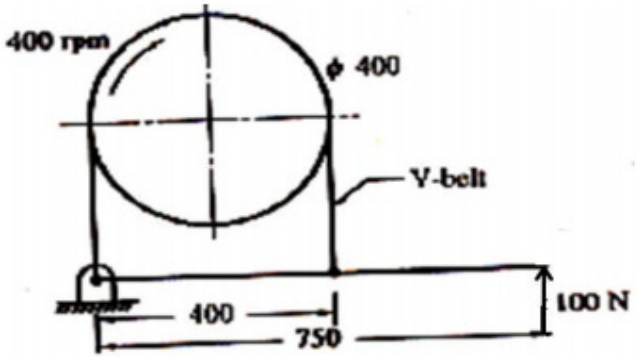

Fig.1

   b) Explain uniform pressure theory for a single plate clutch. [4M]

4. The mass of flywheel of an engine is 6.5tonnes and the radius of gyration is 1.8m. It is found from the turning moment diagram that the fluctuation of energy is 56kN-m. If the mean speed of the engine is 120rpm, find the maximum and minimum speeds. [14M]

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5. A porter governor has equal arms each 250mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of central load on the sleeve is 25kg. The radius of rotation of the ball is 150mm. The governor begins to lift and raises to 200mm when the governor is at maximum speed. Find the range of speed when the friction at the sleeve is equivalent to 10N. [14M]

6. Four masses A, B, C and D are attached to a shaft and revolve in the same plane. The masses are 12kg, 10kg, 18kg and 15kg respectively and their radii of rotations are 40mm, 50mm, 60mm and 30mm. The angular position of the masses B, C and D are 60^0 , 135^0 and 270^0 from mass A. Find the magnitude and position of the balancing mass at a radius of 100mm. [14M]

7. a) With neat sketches, explain the different types of vibrations. [7M]

   b) Determine the frequency of torsional vibrations of the disc shown in Fig.2 if both the ends of the shaft are fixed and the diameter of the shaft is 50mm. The disc has a mass of 100kg and a radius of gyration of 0.5m. Take modulus of rigidity for the shaft material as $80GN/m^2$. I_1=1m and I_2=0.8m. [7M]

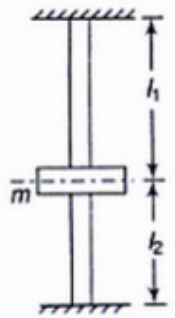

Fig.2

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Code No: R1631031 **R16** SET - 2

III B. Tech I Semester Regular Examinations, October/November - 2018

DYNAMICS OF MACHINERY

(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**

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PART –A

1. a) What is gyroscope? [2M]
   b) List the characteristics of brakes. [2M]
   c) Define the terms: [3M]
   i) Coefficient of fluctuation of energy and
   ii) Coefficient of fluctuation of speed related to the flywheels.
   d) Define sensitiveness of a governor. [2M]
   e) What do you mean by primary and secondary balance in reciprocating engines? [3M]
   f) What is "Critical Damping Coefficient" (C_C) [2M]

PART -B

2. A ship is propelled by a rotor of mass 2000kg rotates at a speed of 2400rpm. The radius of gyration of rotor is 0.4m and spins clockwise direction when viewed from bow (front) end. Find the gyroscopic couple and its effect when: [14M]
   i) The ship takes left turn at a radius of 350 m with a speed of 35kmph
   ii) The ship pitches with the bow rising at an angular velocity of 1rad/s
   iii) The ship rolls at an angular velocity of 0.15rad/s

3. a) Determine the axial force required to engage a cone clutch transmitting 25 kW of power at 750 rpm. Average friction diameter of the cone is 400 mm and average pressure intensity is 60 kN/m^2. Semi cone angle is 10^0 and coefficient of friction is 0.25. Also find the width of the friction cone. [8M]
   b) What do you mean by friction axis and friction circle? Explain. [6M]

4. A multi-cylinder engine is to run at a speed of 600r.p.m. On drawing the turning moment diagram to a scale of 1mm = 250N-m and 1mm = 3^0, the areas above and below the mean torque line are : +160,-172,+168,-191,+197, -162. The speed is to be kept within + 1% of the mean speed of the engine. Calculate the necessary moment of inertia of the flywheel. Determine the suitable dimensions of a rectangular flywheel rim if the breadth is twice its thickness. The density of the cast iron is 7250 kg/m^3 and its hoop stress is 6MPa. Assume that the rim contributes 92 % of the flywheel effect. [14M]

5. The spring controlled governor of the Hartung type has two rotating masses each of 2.5 kg and the limits of their radius of rotation are 100 mm and 125 mm. The each mass is directly controlled by a spring attached to it and to the inner casing of the governor as shown in Fig.1. The stiffness of the spring is 8 kN/m and the force on each spring, when the masses are in their mid-position, is 320 N. In addition, there is an equivalent constant inward radial force of 80 N acting on each revolving mass in order to allow for the dead weight of the mechanism. Neglecting friction, find the range of speed of the governor. [14M]
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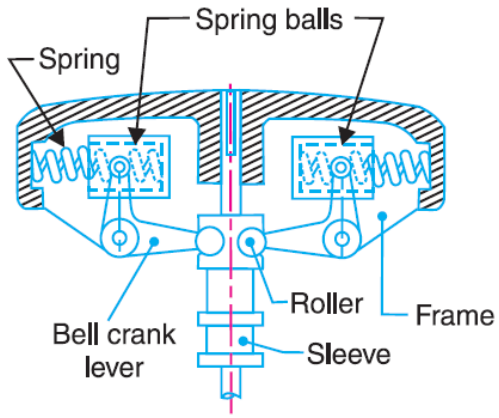

Fig.1

6. A four crank engine has two outer cranks set at 120^0 to each other, and their reciprocating masses are each 400 kg. The distance between the planes of rotation of adjacent cranks are 450 mm, 750 mm and 600 mm. If the engine is to be in complete primary balance, find the reciprocating mass and the relative angular position for each of the inner cranks. If the length of each crank is 300 mm, length of each connecting rod is 1.2 m and the speed of rotation is 240 rpm, what is maximum secondary unbalanced force? [14M]

7. a) What do you understand by whirling of shaft? Explain. [7M]

   b) A gun is so designed that, on firing, the barrel recoil against a spring. A dashpot, at the end of the recoil, allows the barrel to come back to its initial position within the minimum time without any oscillation. The gun barrel has a mass of 500 kg and a recoil spring of 300 N/mm. The barrel recoil 1m on firing. Determine: [7M]
   (i) The initial recoil velocity of the gun barrel
   (ii) The critical damping coefficient of the dashpot engaged at the recoil stroke

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Code No: R1631031 **R16** SET - 3

III B. Tech I Semester Regular Examinations, October/November - 2018

DYNAMICS OF MACHINERY

(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**

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PART –A

1. a) Give the effect of gyroscopic couple on an aircraft when taking a left turn. [2M]
   b) Make a sketch of cone clutch. [2M]
   c) Differentiate between flywheel and governor. [2M]
   d) What are the limitations of a Watt governor? [3M]
   e) Write an expression for hammer blow in locomotive. [3M]
   f) Define Forced Vibrations. [2M]

PART –B

2. a) The moment of inertia of a rotating disc in aeroplane is 15kg-m^2 and the direction of rotation is clockwise when looking from front side of the aeroplane. The speed of the disc is 1600rpm. The speed of flight is 240km/hr. If the aeroplane makes a right turn on a curved path of 170m radius, find the gyroscopic couple on the aeroplane and discuss the effects on it. [10M]
   b) Derive an expression for gyroscopic couple. [4M]

3. a) In a belt transmission dynamometer, the driving pulley rotates at 300rpm. The distance between the centre of the driving pulley and the dead mass is 800mm. The diameter of each of the driving as well as the intermediate pulleys is equal to 360mm. Find the value of the dead mass require to maintain the lever in a horizontal position when the power transmitted is 3kW. Also find its value when the belt just begins to slip on the driving pulley. Coefficient of friction being 0.25 and the maximum tension in the belt 1200N. [7M]
   b) Explain the working of internal expanding shoe break with the help of neat sketch. [7M]

4. The turning moment diagram for a petrol engine is drawn to the following scales: Turning moment 1mm=5N-m; crank angle 1mm=1^o. The turning moment diagram repeats itself at every half revolution of the engine and the areas above and below the mean turning moment line taken in order are 295, 685, 40, 340, 960, 270mm^2. The rotating parts are equivalent to a mass of 36 kg at a radius of gyration of 150mm. Determine the coefficient of fluctuation of speed when the engine runs at 1800r.p.m. [14M]

5. In a Hartnell governor the radius of rotation is 7 cm when speed is 500 rpm. At this speed, ball arm is normal and sleeve is at mid position. The sleeve movement is 2 cm with $\pm$5% of change in speed. The mass of sleeve is 6 kg and friction is equivalent to 25 N at the sleeve. The mass of the ball is 2 kg. If ball arm and sleeve arms are equal, find, [14M]
   (i) Spring rate
   (ii) Initial compression in the spring, and
   (iii) Governor effort and power for 1% change in the speed if there is no friction.
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6. The following data refers to a two- cylinder uncoupled locomotive: [14M]
Rotating mass per cylinder = 280kg
Reciprocating mass per cylinder = 300kg
Distance between wheels = 1400mm
Distance between cylinder centres = 600mm
Diameter of treads of driving wheels =1800mm
Crank radius = 300mm
Radius of centre of balance mass = 620mm
Locomotive speed = 50Km/hr
Angle between cylinder cranks = 90^o
Dead load on each wheel = 3.5tonne
Determine the:
i) Balancing mass required in the planes of driving wheels if whole of the revolving and two-third of the reciprocating mass are to be balanced
ii) Swaying couple
iii) Variation in tractive force
iv) Maximum and minimum pressure on the rails
v) Maximum speed of locomotive without lifting the wheels from the rails

7. a) Derive the differential equation of motion for a free damped vibration. [6M]

b) A shaft of 40mm diameter and 2.5m length has a mass of 15kg per meter length. It is simply supported at the ends and carries three masses of 90kg, 140kg and 60kg at 0.8m, 1.5m and 2m respectively from the left support. Taking E=200GN/m^2 , find the frequency of the transverse vibrations and whirling speed. [8M]

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Code No: R1631031 **R16** SET - 4

III B. Tech I Semester Regular Examinations, October/November - 2018

DYNAMICS OF MACHINERY

(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**

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PART –A

1.	a)	Define axis of spin and axis precession.	[2M]
	b)	What is Band brake?	[2M]
	c)	State the applications of Flywheel	[2M]
	d)	What is the function of a governor? How does it differ from that of a flywheel ?	[3M]
	e)	How do you balance several masses rotating in the same plane?	[3M]
	f)	What is whirling speed of the shaft?	[2M]

PART -B

2.	a)	The motor of a marine ship having a mass of 1200kg and radius of gyration 350 mm rotates at 1500 rpm clockwise when looking from bow. Determine the gyroscopic couple and its effect on the ship in the following cases: i) When the ship pitches with an angular velocity of 1rad/sec when the bow Rising ii) When the ship is speeding at 50km/hr and takes a right turn in a circular path of 200m radius iii) When the ship rolls at certain instant, it has an angular velocity of 0.75 rad/sec when viewed from the stern.	[10M]
	b)	What do you meant by gyroscopic couple? Derive a relation for magnitude.	[4M]
3.	a)	The mean diameter of a square threaded screw jack is 50 mm. The pitch of the thread is 10mm. The coefficient of friction is 0.15. What force must be applied at the end of a 0.7m long lever, which is perpendicular to the longitudinal axis of the screw to raise a load of 20kN and to lower it?	[7M]
	b)	With a neat sketch explain the working of Multi plate clutch.	[7M]
4.	a)	The mass of fly wheel of an engine is 1800 kg and its radius of gyration is 0.7m. The starting torque of the engine is 1200 N-m which may be assumed to be constant. Determine the angular acceleration of the wheel, speed and energy stored by it.10 seconds after starting from rest.	[8M]
	b)	Write notes on following: i) Turning moment diagram ii) coefficient of fluctuation of speed.	[6M]
5.		A Proell governor has equal arms of length 300 mm. 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 80 mm long and parallel to the axis when the radii of rotation of the balls are 150 mm and 200 mm. The mass of each ball is 10 kg and the mass of the central load is 100 kg. Determine the range of speed of the governor.	[14M]
~~~~~~

6. a) Four masses A, B, C & D are completely balanced. Masses C & D makes an angle of 90^0 and 195^0 respectively with that of mass B in the counterclockwise direction. The rotating masses have the following properties: masses at B, C & D are 25 Kg, 40 Kg and 35 Kg respectively with their radii of rotations are 200 mm, 100 mm & 180 mm respectively. The radius of rotation of mass A is 150 mm. Planes B & C are 250 mm apart. Determine the
i) mass A and its angular position with that of mass B,
ii) position of all the planes relative to plane of mass A. [10M]

b) Explain why the reciprocating masses are partially balanced. [4M]

7. a) Governing equation of motion of an under damped single degree of freedom system with a mass of 31 kg is given as $\mathbf{d^2x/dt^2 + (3c/7m)\ dx/dt + (27k/7m)x = 0.}$The amplitude of damped vibration reduces from 3mm to 2mm in successive vibrations in a duration of 0.1 seconds. Evaluate:
i) frequency of damped vibration, ii) logarithmic decrement iii) damping factor,
iv) natural frequency, v) stiffness and vi) damping coefficient [7M]

b) Write short note on following i) vibration isolation ii) Dunkerly's method. [7M]

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Code No: R1631041 **R16** SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018

COMPUTER ARCHITECTURE AND ORGANIZATION

(**Common to** Electronics and Communication Engineering, Electronics and Instrumentation 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 digital computer? Describe the type of computers.	[2M]
	b)	What are four types of operations performed by computer instructions?	[2M]
	c)	Write a note on register operands of an arithmetic instruction.	[2M]
	d)	Define interrupt and interrupt service routine.	[3M]
	e)	Discuss briefly about read only memory.	[3M]
	f)	Describe the timing of the control signal during the Add step.	[2M]

PART -B

2.	a)	Draw the connections between the processor and main memory and explain the basic operational concepts.	[7M]
	b)	Write a note on arithmetic and logical unit.	[7M]
3.	a)	Explain the following addressing modes i) Register mode ii) Immediate mode iii) Indirect mode iv) Absolute mode.	[7M]
	b)	Discuss briefly about Assembly language notations.	[7M]
4.	a)	List the types of component instruction and explain it.	[7M]
	b)	Explain input/output operations of computer architecture.	[7M]
5.	a)	Draw the input-output interface for an input device and explain accessing of input-output device.	[7M]
	b)	Discuss briefly about universal serial bus (USB).	[7M]
6.	a)	Explain briefly about Associate-mapped and set-associate mapped cache.	[7M]
	b)	Write a short note on flash memory.	[7M]
7.	a)	Draw and explain the hardwired control unit organization and encoding function.	[7M]
	b)	Define the term micro programmed control? Draw the basic organization of a micro programmed control unit and explain it.	[7M]

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Code No: R1631041 **R16** SET - 2

III B. Tech I Semester Regular Examinations, October/November - 2018

COMPUTER ARCHITECTURE AND ORGANIZATION

(**Common to** Electronics and Communication Engineering, Electronics and Instrumentation 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 program? Explain about the term input unit.	[2M]
	b)	Define and discuss about straight-line sequencing.	[2M]
	c)	Write a note on immediate operands of an arithmetic operands.	[2M]
	d)	Define interrupt-acknowledge signal and interrupt latency.	[3M]
	e)	Discuss briefly about PROM.	[3M]
	f)	What action are required for executing this instruction Add (R3),R1.	[2M]

PART –B

2.	a)	Draw and explain single bus structure.	[7M]
	b)	Draw the functional unit of a computer and discuss about the control unit in details.	[7M]
3.	a)	Explain the following addressing modes. i) Index mode ii) Auto increment mode iii) Auto decrement mode.	[7M]
	b)	Write a short note on rotate instructions.	[7M]
4.	a)	Write a short note on branch instruction.	[7M]
	b)	Discuss briefly about secondary storage devices.	[7M]
5.	a)	Discuss about Synchronous bus and draw the timing diagram of input transfer of synchronous bus.	[7M]
	b)	Discuss briefly about peripheral component interconnect (PCI).	[7M]
6.	a)	Define locality of reference and explain use of a cache memory and direct – mapped cache.	[7M]
	b)	Write a short note on interleaving.	[7M]
7.	a)	Define ALU? Explain the arithmetic and logical operation.	[7M]
	b)	Draw the microinstruction-sequencing organization of next-address field and explain it.	[7M]

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Code No: R1631041 **R16** SET - 3

III B. Tech I Semester Regular Examinations, October/November - 2018

COMPUTER ARCHITECTURE AND ORGANIZATION

(**Common to** Electronics and Communication Engineering, Electronics and Instrumentation 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)	Describe the term memory unit.	[2M]
	b)	Define and discuss about instruction execute.	[2M]
	c)	Write a note on shifted immediate operand.	[2M]
	d)	Write a note on DMA.	[3M]
	e)	Discuss briefly about EPROM.	[3M]
	f)	Write the control sequence for execution of the instruction Add(R3),R1.	[2M]

PART –B

2.	a)	Write about the history of development of the computer.	[7M]
	b)	Define system software? Discuss briefly about software and its processor time.	[7M]
3.	a)	Discuss briefly about basic input/output operations.	[7M]
	b)	Write a note on shift instruction.	[7M]
4.	a)	List and explain any three types of addressing modes of computer organization.	[7M]
	b)	What are logic Instructions? Explain.	[7M]
5.	a)	Write a note on enabling and disabling interrupts.	[7M]
	b)	Discuss about Interface Circuits.	[7M]
6.	a)	Draw and explain a block diagram of a 4M*32 memory unit using 1M*4DRAM chips.	[7M]
	b)	Write a short note on optical disks.	[7M]
7.	a)	Write a short note on register transfers.	[7M]
	b)	Draw the flowchart of a micro program for the Add scr, Rdst instruction.	[7M]

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Code No: R1631041 **R16** SET - 4

III B. Tech I Semester Regular Examinations, October/November - 2018

COMPUTER ARCHITECTURE AND ORGANIZATION

(**Common to** Electronics and Communication Engineering, Electronics and Instrumentation 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 the term processor and discuss about output unit.	[2M]
	b)	Discuss about Condition Register (CR) and Integer Exception Register (XER).	[2M]
	c)	Write a note on condition codes for branch instruction.	[2M]
	d)	Discuss about interrupt vector.	[3M]
	e)	Discuss briefly about EEPROM.	[3M]
	f)	Write the control sequence for an unconditional branch instruction.	[2M]

PART –B

2.	a)	Discuss the basic aspects of computer performance.	[7M]
	b)	Draw and explain the Read and Write requests and timing diagram of a read operation of CPU and external bus transfer.	[7M]
3.	a)	Explain the role of stack and queues in computer programming equation.	[7M]
	b)	Write a note on logic instructions.	[7M]
4.	a)	Explain about Arithmetic Instructions	[7M]
	b)	What is the significance of Addressing modes? Explain.	[7M]
5.	a)	Define DMA and draw the two-channel DMA controller and explain it.	[7M]
	b)	Draw and explain input/output interface circuit connecting a keyboard to an asynchronous bus.	[7M]
6.	a)	Discuss briefly about basic memory circuits.	[7M]
	b)	Write a short note on magnetic hard disks.	[7M]
7.	a)	Discuss how to fetch a word from memory.	[7M]
	b)	Explain the microinstructions of the micro programmed control.	[7M]

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Code No: R1631051 **R16** SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018

COMPILER DESIGN

(Computer Science and 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 a preprocessor? Mention its objectives.	[2M]
	b)	What is recursive decent parsing?	[2M]
	c)	Define inherited and synthesized attributes.	[2M]
	d)	What is three-address code? Give an example.	[3M]
	e)	Draw the typical structure of an activation record.	[3M]
	f)	What is dead code?	[2M]

PART -B

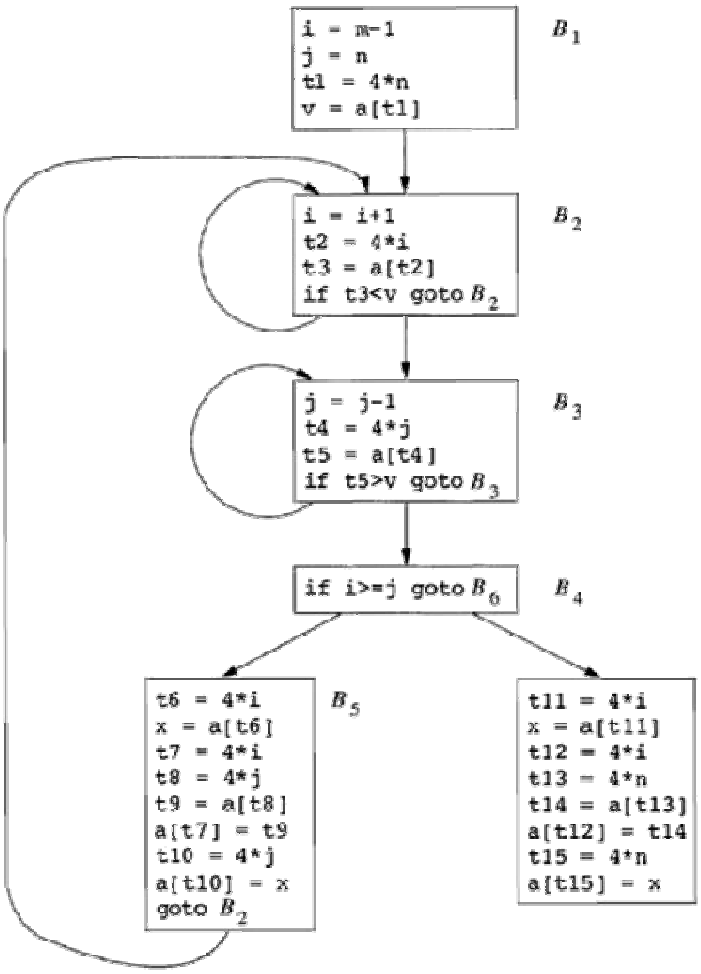
2.	a)	Write regular expressions for the following languages: i) All strings of lowercase letters that contain the five vowels in order. ii) All strings of lowercase letters in which the letters are in ascending lexicographic order. iii) All strings of a's and b's with an even number of a's and an odd number of b's.	[7M]
	b)	Differentiate between static and dynamic scoping.	[7M]
3.	a)	Present the formal definition and notational conventions of CFG.	[7M]
	b)	Explain the procedure for eliminating ambiguity from a grammar. Give an example.	[7M]
4.	a)	Differentiate between LR(1), Canonical-LR and LALR parsing methods.	[7M]
	b)	Below grammar generates binary numbers with a "decimal" point: $S \rightarrow L . L \mid L$ $L \rightarrow LB \mid B$ $B \rightarrow 0 \mid 1$ Design an L-attributed SDD to compute S.val, the decimal-number value of an input string.	[7M]
5.	a)	Give Three-Address Code and it's quadruple representation for the assignment: a = b * - c + b * - c ;	[6M]
	b)	Discuss in detail about type synthesis and type inference.	[8M]
~~~~~~

6. a) What are the limitations of access links? How displays solve those issues? Explain an example. [7M]

   b) Generate code for the following three-address statements assuming a and b are arrays whose elements are 4-byte values: [7M]

   x = a [i]
   y = b [j]
   a [i] = y
   b [j] = x

7. a) Identify and eliminate global common subexpressions in the flow graph below: [9M]



   b) Explain data-flow abstraction with an example. [5M]

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III B. Tech I Semester Regular Examinations, October/November - 2018

COMPILER DESIGN

(Computer Science and 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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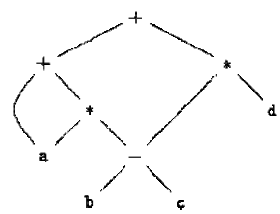
PART –A

1. a) What happens in Analysis and Synthesis phases of compilation? [2M]
   b) Define an ambiguous grammar. [2M]
   c) What is lookahead-LR parsing? [2M]
   d) Compute three-address code for the DAG below: [3M]



   e) What does heap and stack areas of run-time memory store? [3M]
   f) Define a global common sub expression. [2M]

PART -B

2. a) How compilers can be used for optimization in parallel systems? [7M]
   b) With a suitable transition diagram, explain recognition of keywords and identifiers. [7M]

3. a) Consider the context-free grammar: S -> S S + \ S S * \ a. For the string aa + a* give a leftmost derivation, rightmost derivation and a parse tree. [7M]
   b) Construct SLR parsing table for the grammar in above question. [7M]

4. a) Show that the following grammar: [7M]
   S → Aa | bAc | Bc | bBa
   A → d
   B → d
   is LR(1) but not LALR(l).
   b) Discuss in detail about dependency graphs with suitable examples. [7M]

5. a) Write about type inference for polymorphic functions. [7M]
   b) Translate the arithmetic expression a[i] = b*c - b*d into a syntax tree, quadruples and triples. [7M]

6. a) What are the principles associated with designing calling sequences and the layout of activation records? [7M]
~~~~~~

b) Generate code for the following three-address statements assuming stack allocation, where register SP points to the top of the stack. [7M]

```
call p
call q
return
call r
return
return
```

7. a) Discuss about copy propagation and dead code elimination. [7M]

b) With suitable examples, explain about live-variable analysis. [7M]

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Code No: R1631051 **R16** SET - 3

III B. Tech I Semester Regular Examinations, October/November - 2018

COMPILER DESIGN

(Computer Science and 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)	List any 4 compilers and 2 interpreters you know.	[2M]
	b)	What is the key difference between lexical analysis and parsing?	[2M]
	c)	What is syntax-directed definition?	[2M]
	d)	Give three-address code for the statement: do i = i + 1 ; while (a [i] < v);	[3M]
	e)	What is an activation link? Give an example.	[3M]
	f)	Define a transfer function.	[2M]

PART -B

2.	a)	What are program translators? Explain.	[7M]
	b)	Describe the languages denoted by the following regular expressions: (i) (a|b)*a(a|b)(a|b. (ii) a*ba*ba*ba*	[7M]
3.	a)	Give an algorithm to eliminate productions containing useless symbols from a grammar.	[7M]
	b)	Compute FIRST and FOLLOW for the grammar: S -> S S + \ S S * \ a	[7M]
4.	a)	Present the algorithm for LALR parsing table construction.	[7M]
	b)	For the grammar below: $E \rightarrow E + T \mid T$ $T \rightarrow num\ .\ num \mid num$ Give an SDD to determine the type of each term T and expression E.	[7M]
5.	a)	Explain the value-number method for constructing the nodes of a DAG.	[7M]
	b)	Generate three-address code for the grammar below: (B is a Boolean expressing and S is a statement) $S \rightarrow$ if (B) S_1 $S \rightarrow$ if (B) S_1 else S_2 $S \rightarrow$ while (S) S_1	[7M]
6.	a)	List and explain different subdivisions of run-time memory.	[4M]
~~~~~~

b) Construct flow graph for the three-address code equivalent of the below code: [10M]

```
for (i=0; i<n; i++)
        for (j=0; j<n; j++)
                c[i] [j] = 0.0;
for (i=0; i<n; i++)
        for (j=0; j<n; j++)
                for (k=0; k<n; k++)
                        c[i][j] = c[i][j] + a[i][k]*b[k][j];
```

7. a) Optimize the code given below, by eliminating common subexpressions, performing reduction in strength on induction variables, and eliminating all the induction variables. [7M]

```
   dp = 0.
   i = 0
L: tl = i*8
   t2 = A[tl]
   t3 = i*8
   t4 = B[t3]
   t5 = t2*t4
   dp = dp+t5
   i = i+1
   if i<n goto L
```

b) Explain the procedures for elimination of unreachable code and algebraic simplifications in Peephole Optimization [7M]

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Code No: R1631051 **R16** SET - 4

III B. Tech I Semester Regular Examinations, October/November - 2018

COMPILER DESIGN

(Computer Science and 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 the purpose of Loader/Linker in language processing?	[2M]
	b)	What are left-most and right-most derivations?	[2M]
	c)	What is an annotated parse tree? Give an example.	[2M]
	d)	Give directed acyclic graph for the expression: a + a * (b - c) + (b - c) * d.	[3M]
	e)	What are the basic functions of the memory manager?	[3M]
	f)	Define a semi lattice.	[2M]

PART -B

2.	a)	List and explain in detail about different phases of compilation.	[9M]
	b)	What are the problems that might arise while recognizing tokens?	[5M]
3.	a)	Design grammars for the following languages: (i) The set of all strings of 0s and 1s, such that every 0 is immediately followed by at least one 1. (ii) The set of all strings of 0s and 1s that are palindromes.	[7M]
	b)	Explain the structure of LR parsing table, with an example.	[7M]
4.	a)	Discuss about the Dangling-Else ambiguity.	[7M]
	b)	Explain the procedure for eliminating left recursion from SDTs.	[7M]
5.	a)	Explain about one-pass code generation using back patching.	[7M]
	b)	Construct parse trees for the types in t [2] [3] and char [10].	[7M]
6.	a)	The following C program computes Fibonacci numbers:	[7M]

```
int  f (int  n) {
        int  t,s;
        if (n < 2) return 1;
        s = f(n-1);
        t = f(n-2);
        return s+t;
}
```

Suppose that the activation record for f includes the following elements in order: return value, argument n, local s, and local t. Show the complete activation tree for the call f(5).

	b)	Discuss the design issues of Code Generator.	[7M]
7.	a)	Explain about the method of computing transfer equations for reaching definitions.	[7M]
	b)	Construct an algorithm that will perform redundant-instruction elimination in a sliding peephole on target machine code.	[7M]

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Code No: RT31012 **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, October/November-2018

STRUCTURAL ANALYSIS – II

(Civil 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) What is the effect of Temperature on two hinged arches? Write an expression to find the effect of (rise or fall) temperature in two hinged arch. [4M]

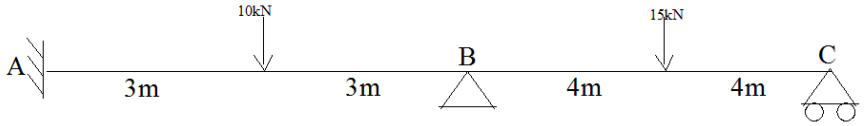
b) Differentiate between Portal method and Cantilever method in the analysis of lateral loads acting on the structure. [3M]

c) Give an expression to find the effect of Temperature in two hinged stiffened girder of cable stayed suspension bridge. [4M]

d) Give any Two Differences between Sway and Non-sway analysis of portal frames. Under what circumstances the above methods are used. [3M]

e) Define Static and Kinematic Indeterminacy with an example. [4M]

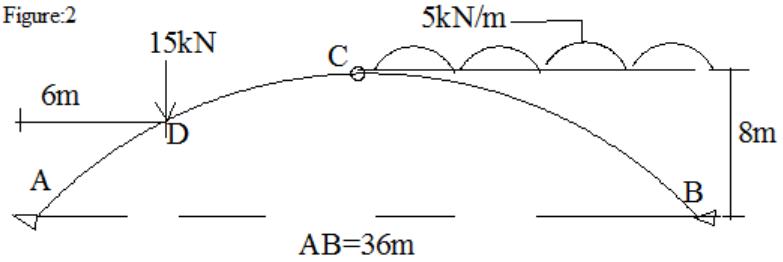
f) Determine support moments (A,B,C) by Kani's method [4M]



PART -B

2 a) Determine the horizontal thrust and draw bending moment diagram, shear force diagram and find normal thrust at point 'D' of three hinged parabolic arch ACB as shown in figure:2 [10M]

Figure:2



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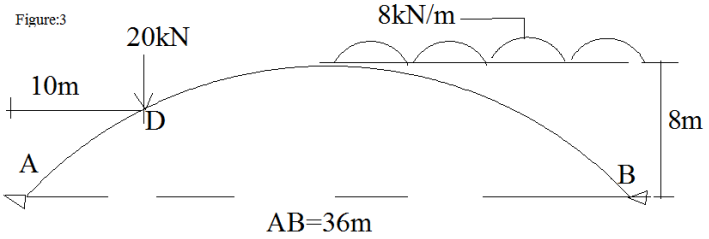
b) Find the horizontal thrust of two hinged parabolic arch shown Figure :3. Also draw bending moment diagram .Assume the moment of Inertia at any section varies as the secant of slope at the section. Neglect rib shortening effect. [6M]

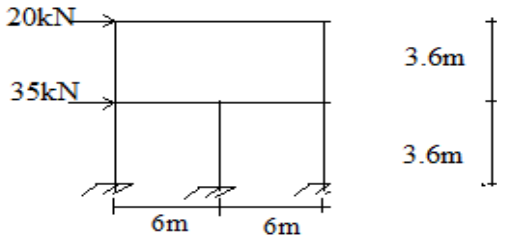
Figure:3



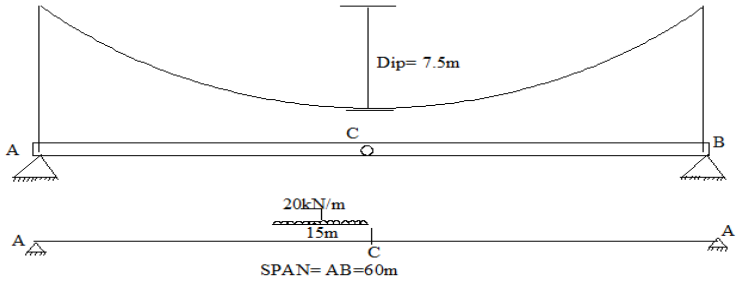
3 a) Write the limitations in Portal frame method of approximate analysis. [4M]

b) Analyze the two storey rigid moment resisting frame shown in figure:4 by Cantilever method. Draw the BMD and SFD. Assume uniform flexural rigidity of beams and columns. [12M]

Figure:4



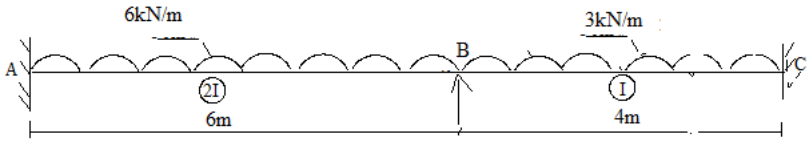
4 a) The cables of suspension bridge have span 60m and central dip 7.5m. Each cable stiffened by girder hinged at ends and also at middle C to maintain parabolic shape of cable. The girder subjected to dead load 10kN/m and live load 20kN/m of 15m long. Find the maximum tension in cable when leading edge of the live load is just at centre C of the girder. Draw SFD and BMD of girder. [10M]



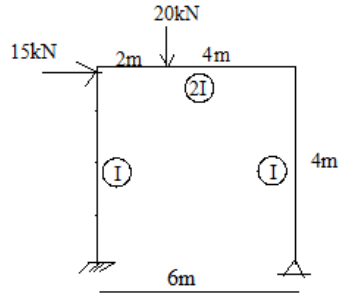
b) A two hinged stiffened girder AB of span 100 m and central dip 10m is subjected to two point loads 250 kN and 350 kN at 30m and 70m from left support respectively. Find Shear force and Bending moment at 35m from left end . [6M]

Code No: RT31012 **R13** SET - 1

5 a) Analyze the continuous beam shown in figure, by moment distribution method. Assume E=2x10^5 MPa and I=8x10^{6}mm^{4+} and draw Shear force and Bending moment diagram [8M]

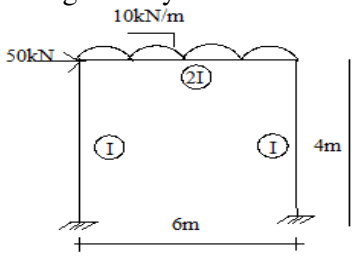


b) Analyze the portal frame as shown in figure by moment distribution method and draw Bending moment diagraM. (Assume E=2x10^5 MPa and I=6x10^{6}mm^4) [8M]

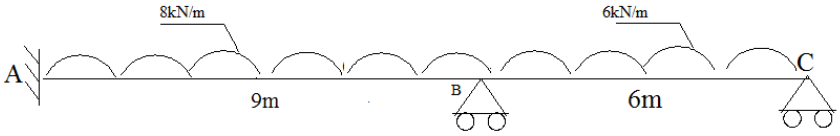


6 a) Write the steps involved in Kani's method [4M]

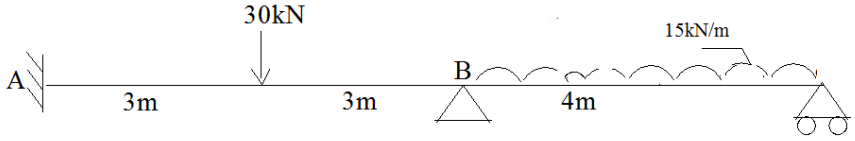
b) Analyze the frame shown in figure:9 by Kani's method [12M]



7 a) Analyze the continuous beam shown in figure by Flexibility method . Assume down ward settlement of support B is 30mm.Assume uniform flexural rigidity of beam ABC , and EI=14x10^{11}N-mm^2 [8M]



b) Analyze the continuous beam shown in figure by Stiffness method .Assume uniform flexural rigidity of beam AB and BC= EI=16x10^{11} N-mm^2 [8M]



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Code No: RT31032 **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, October/November - 2018

METAL CUTTING & MACHINE TOOLS

(Mechanical 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)	What are the factors responsible for built-up edge in cutting tools?	[3M]
	b)	What is thread cutting operation?	[4M]
	c)	Mention the operation performed by planer?	[4M]
	d)	Define "climb milling".	[3M]
	e)	How do you classify grinding operation?	[4M]
	f)	Write the advantages of computer numerical control system.	[4M]

PART -B

2	a)	A tool life of 110 minutes is obtained at 25mpm and 10 minutes at 65mpm. What is the tool equation? Determine cutting speeds values for tool life of 1 minute and 200 minutes. Also determine the tool life values for a speed of 50mpm and 80mpm.	[8M]
	b)	What is the use of a chip breaker? Discuss the various types of chips produced during metal machining process.	[8M]
3	a)	Explain the salient features of an automatic screw machines.	[8M]
	b)	Name the different methods of taper turning done on a centre lathe and explain any two methods with neat sketch.	[8M]
4	a)	Explain the constructional features of a twist drill and label the important features with a neat diagram	[8M]
	b)	Describe the method of producing curved surface on a planner.	[8M]
5	a)	Classify milling machines. Sketch and describe principal parts of a column and knee type machine	[8M]
	b)	Explain the methods of holding milling cutters.	[8M]
6	a)	List the various factors to be considered in selection of grinding wheel? Discuss them in detail.	[8M]
	b)	Explain centre less grinding process with a neat sketch.	[8M]
7	a)	Describe the main features of CNC machines, which distinguish them from conventional machine tools.	[8M]
	b)	Explain briefly the following locating devices: i) Cylindrical locators ii) Diamond pin locator	[8M]

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Code No: RT31042 **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, October/November - 2018

LINEAR IC APPLICATIONS

(Common to Electronics and Communication Engineering, Electronics and Instrumentation Engineering and Electronics and Computer 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)	What is a Level translator?	[3M]
	b)	Define slew rate and PSRR	[4M]
	c)	Draw the circuit of (i) voltage to current (V to I) converter with grounded load (ii) current to voltage (I to V) converter with grounded load	[4M]
	d)	Mention the applications of Analog switches.	[4M]
	e)	Define lock range, capture range and pull-in-time.	[4M]
	f)	Draw the circuit of R-2R ladder DAC.	[3M]

PART -B

2	a)	What is an Op-amp. Briefly explain the necessity and function of different stages of an Op-amp with respect to its block schematic.	[8M]
	b)	Explain the DC analysis of single input unbalanced output amplifier.	[8M]
3	a)	Define and explain the significance of following terms : i)CMRR ii) Drift	[8M]
	b)	List out electrical characteristics of an op-amp.	[8M]
4	a)	Draw the circuit diagram of instrumentation amplifier using 741 op - amp and explain its operation.	[8M]
	b)	With a neat sketch explain the op-amp differentiator circuit.	[8M]
5	a)	Explain the operation of a sample and hold amplifier.	[10M]
	b)	Explain IC1496 balanced modulator with a neat sketch.	[6M]
6	a)	Explain the operation of Schmitt trigger circuit with input and output waveforms.	[8M]
	b)	Describe PLL with block diagram. Also discuss applications of PLL in phase detector and voltage controlled oscillator.	[8M]
7	a)	Explain the working of a dual slope A/D converter.	8M]
	b)	Enlist the advantages and disadvantages of dual slope ADC.	[8M]

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Code No: RT31052 **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, October/November- 2018

DATA COMMUNICATION

(Common to Computer Science Engineering and Information Technology)

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)	How we can check the effectiveness of data communication?	[3M]
	b)	What are the classes of transmission media?	[4M]
	c)	Define A law companding and μ law companding	[4M]
	d)	What are the Optical Properties of Radio Waves?	[4M]
	e)	Explain the Call Progress Tones and Signals.	[4M]
	f)	What is meant by Modem Synchronization?	[3M]

PART -B

2	a)	Explain about Data communication networks.	[4M]
	b)	Discuss about ISO/OSI reference model with neat sketch.	[8M]
	c)	What is the significance of layered architecture in Computer networks?	[4M]
3	a)	Write the advantages of optical fiber communication.	[3M]
	b)	with neat block diagram, explain the general system of optical fiber communication	[8M]
	c)	Discuss about laser diode.	[5M]
4	a)	What are the drawbacks of DM? How can we overcome those drawbacks?	[8M]
	b)	Discuss about WDM in detail.	[8M]
5	a)	List and explain the Optical Properties of Radio Waves?	[8M]
	b)	Discuss in brief the application of satellite communications.	[8M]
6	a)	Explain the concept of Paging systems.	[8M]
	b)	List out the Difference between analog and digital systems.	[8M]
7	a)	Explain the significance of barcodes in detail	[8M]
	b)	Write short notes on 56K Modems.	[8M]

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Code No: **R31052** **R10** **Set No. 1**

III B.Tech I Semester Supplementary Examinations, October/November- 2018

COMPUTER NETWORKS

(Common to Computer Science Engineering & Information Technology)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1	a)	Explain TCP/IP reference model in detail and compare it with OSI reference model	[10M]
	b)	Explain the following addressing i)Physical addressing ii) logical addressing iii) port addressing iv) Specific addressing	[5M]
2	a)	What is multiplexing? Explain frequency division multiplexing	[7M]
	b)	What is Switching? Explain circuit switched networks	[8M]
3	a)	Explain error detection and correction codes in brief	[5M]
	b)	Explain simplex stop-and –wait protocol and Simples protocol for noisy channel of data link protocols	[10M]
4		Explain sliding window protocols in detail	[15M]
5	a)	Explain controlled medium access protocols in detail	[8M]
	b)	What is channelization? Explain frequency division multiple access	[7M]
6	a)	Explain Manchester encoding in detail	[5M]
	b)	Explain standard Ethernet MAC sub layer and physical layer	[10M]
7	a)	Explain cellular telephony in detail	[5M]
	b)	Explain GEO,LEO and MEO satellite networks	[10M]
8	a)	Explain different brides in detail	[7M]
	b)	Explain virtual LANs in detail	[8M]

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