

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

STRUCTURAL ANALYSIS – II

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

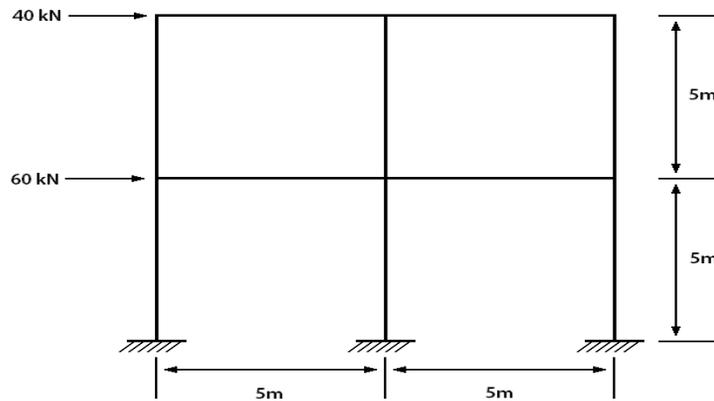
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**

PART - A

1. a) Distinguish between two hinged and three hinged arches. [2M]
- b) What are the different approximate methods for lateral load analysis? [2M]
- c) What are the temperature stresses in a cable? [2M]
- d) What is substitute frame analysis? [3M]
- e) What is the settlement of supports in Kani's method? [3M]
- f) What are different Matrix methods explain. [2M]

PART - B

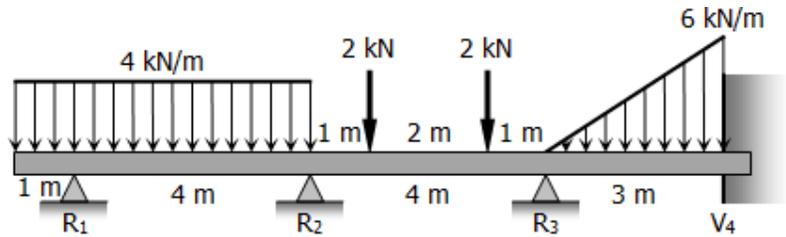
2. A three hinged parabolic arch hinged at the crown and springing has a horizontal span of 12m and a central rise of 2.5m. it carries a udl of 30 kN/m run over the left hand half of the span. Calculate the resultant at the end hinges. [14M]
3. Analyse the frame using Portal Method [14M]



4. a) Deduce an expression for general cable theorem? [10M]
- b) What are stiffening girders? Discuss. [4M]



5. Compute the moments over the supports of the beam shown in Figure below: [14M]



6. Analyze a continuous beam having a 3- bays of Span 3 m each by Kani's' method. [14M]
7. Explain the matrix approach to structural analysis of continuous beams. [14M]



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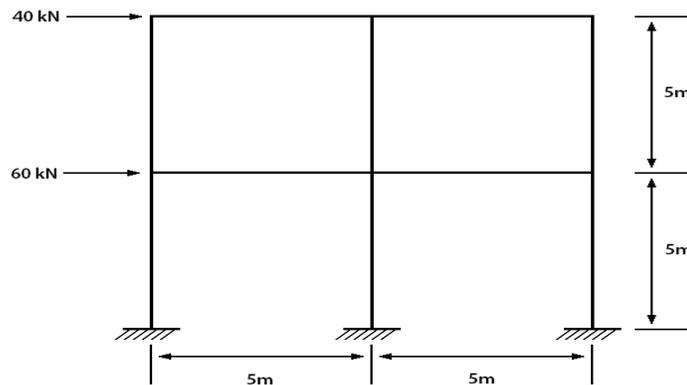
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PART - A

1. a) What is a Two Hinged Arch? [2M]
- b) Mention two assumptions in cables and suspension bridges. [2M]
- c) Differentiate between cantilever and portal method. [2M]
- d) Write the formulae for sinking of supports in Moment Distribution method. [3M]
- e) What are the displacements for sway and without sway in Kani's method? [3M]
- f) What are the characteristics of stiffness method? [2M]

PART - B

2. A 3-hinged arch is circular, 25 m in span with a central rise of 5m. It is loaded with a concentrated load of 10 kN at 7.5m from the left hand hinge. Find the
 i) Horizontal thrust ii) Reaction at each end hinge
 iii) Bending moment under the load [14M]
3. Analyze the frame by Cantilever method [14M]



4. A three hinged suspension girder bridge has a span of 300m over the supports at same level. It has a central dip of 30m. The girder carries three point loads of 20kN, 30kN and 40kN acting at 45m, 90m and 160m respectively from the left end. Draw the B.M.D. [14M]
5. Derive the equation of moment distribution. [14M]
6. Analyze a two bay portal frame by Kani's method. [14M]
7. Distinguish between Flexibility method and Stiffness method. [14M]

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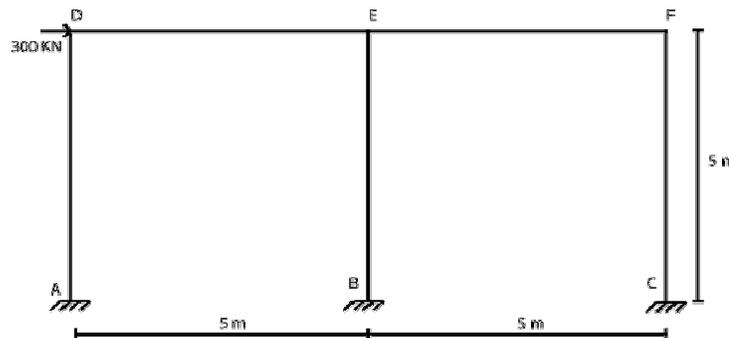
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1. a) What is a statically indeterminate arch? [2M]
- b) Write any two assumptions made in the analysis of cables. [2M]
- c) What are the assumptions of Cantilever method? [2M]
- d) Define a distribution factor. [3M]
- e) Mention any two advantages of Kani's method over moment distribution method. [3M]
- f) What are the characteristics of flexibility method? [2M]

PART -B

2. A three hinged parabolic arch has a span of 12m. The central rise of the arch is 4m. It is loaded with a uniformly distributed load of intensity 2 kN/m at the left 5m length. i) Calculate the maximum positive and negative bending moments. [14M]
ii) Calculate the bending moment, normal thrust and shear at 3m and 9m from left end.
3. Analyse the frame using Portal method. [14M]



4. A three hinged suspension girder bridge has a span of 250m over the supports at same level. It has a central dip of 30m. The girder carries three point loads of 30kN, 35kN and 45kN acting at 35m, 80m and 150m respectively from the left end. Draw the B.M.D. [14M]
5. Analyze the portal frame by moment distribution method. Draw the bending moment diagram and sketch the deflected shape of the structure. The two columns of AB and CD of 54m height with I, Beam BC of span 5m, with 2I. The beam BC carries an udl of 15 kN/m. The supports at A and D are fixed [14M]
6. What are the steps involved in the analysis of a porter frame by Kani's method? [14M]
7. Explain the matrix approach to structural analysis of continuous beams. [14M]



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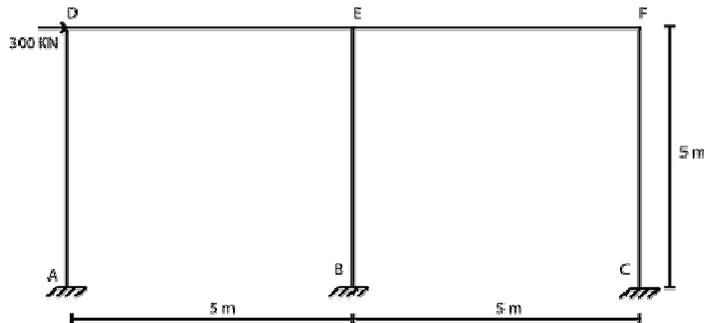
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1. a) Write about rib shortening and temperature stresses. [2M]
- b) What are the assumptions of Portal method? [2M]
- c) What are the characteristics of a cable? [2M]
- d) Write about stiffness factor and carry over factor. [3M]
- e) What is a rotational factor at a joint? [3M]
- f) Differentiate between flexibility method and stiffness method. [2M]

PART -B

2. Derive the expression for normal thrust, radial shear and horizontal thrust for a two hinged circular arch. [14M]
3. Analyse the frame by using Cantilever method. [14M]



4. A cable hangs between two supports at a distance 140m apart. One end of the support is 4m above the other. The cable is loaded with a udl of 1 kN/m. The sag of the cable from higher end is 6m. Find the horizontal thrust and the maximum tension in the cable. [14M]
5. Using moment distribution method analyze the two span continuous beam. The moment of inertia of AB = I while that of BC = 2I. The ends A and C are Fixed. Sketch the B.M. and S.F. diagram. Span AB carries a concentric load of 40 kN with a span of 8m and span BC carries an udl of 30 kN/m over a span of 10m. [14M]
6. Analyze the portal frame using Kani's procedure. The two columns of AB and CD of 6m height, Beam BC of span 10m, with EI constant. The column CD carries an udl of 30 kN/m. The supports at A and D are fixed. [14M]
7. Discuss the flexibility and stiffness method respect to continuous beam. [14M]



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

RENEWABLE ENERGY SOURCES

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

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2. Answer **ALL** the question in **Part-A**

3. Answer any **FOUR** Questions from **Part-B**

PART -A

- | | | | |
|----|----|---|------|
| 1. | a) | Distinguish between the term irradiance and irradiation. | [2M] |
| | b) | What do you understand by Solar thermal Energy? | [2M] |
| | c) | Distinguish between a Solar cell, Module, Panel and Array. | [2M] |
| | d) | Explain the variation of Wind speed with consideration of height from the ground. | [3M] |
| | e) | Give the classification of small hydro Power stations. | [3M] |
| | f) | What are the various losses occurring in the fuel cell? | [2M] |

PART -B

- | | | | |
|----|----|--|------|
| 2. | a) | Explain the following terms used in Solar radiation analysis:
i) Hour angle ii) Solar azimuth angle iii) Declination angle | [7M] |
| | b) | Explain the terms extraterrestrial radiation and terrestrial radiation w.r.t solar radiation. | [7M] |
| 3. | a) | Explain in detail about the Flat plate Collectors and give its advantages and Disadvantages. | [7M] |
| | b) | Draw the schematic diagram for Solar pond based electric plant along with its working. | [7M] |
| 4. | a) | Derive an expression for efficiency and power produce by PV cell. Explain the various factors that affect the performance of cell. | [7M] |
| | b) | Explain the significance of Perturb and Observe MPPT method and how it can realized. | [7M] |
| 5. | a) | Find the tip – speed ratio if a 6 m diameter rotor has rotation of 20 rpm and the wind speed is 4 m/s. What is the implication of tip speed ratio? | [7M] |
| | b) | Discuss the aerodynamic considerations in wind mill design in detail. | [7M] |
| 6. | a) | Explain the basic components of Tidal Power Plants and give their significance. | [7M] |
| | b) | List the advantages and limitations of Small scale Hydroelectric Units. | [7M] |
| 7. | a) | Explain the current – voltage characteristics of Fuel Cell and give its Significance. | [7M] |
| | b) | What are the advantages and disadvantages of geothermal energy? | [7M] |



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PART -A

1. a) Distinguish between Conventional resources and Non-conventional sources. [2M]
- b) What are Solar thermal Energy applications? [2M]
- c) What is the depletion layer in p – n junction? [2M]
- d) List the factors responsible for distribution of wind energy on the surface of the earth? [3M]
- e) Explain the basic principle of Tidal Power. [3M]
- f) List the various Biomass Resources. [2M]

PART -B

2. a) Explain in detail about the Beam radiation and diffuse radiation. [7M]
- b) Determine the Local Apparent Time corresponding to 1500 h (IST) [7M]
 Mumbai ($19^{\circ}07'$, $75^{\circ} 51$ E) on 1 July. In India, IST is based on 82.50° E. On 1 July, equation of time correction is equal to $- 4$.
3. a) Compare between the concentrating collector over Flat collector. [7M]
- b) Explain the working of Solar Water heater with component based diagram. [7M]
4. a) Explain the effect of radiation intensity and temperature on the short circuit current , open circuit voltage and power generated by PV cell. [7M]
- b) Explain with a neat algorithm of Hill climbing MPPT Technique and give its merits. [7M]
5. a) Explain Betz model of expanding air stream tube to determine extraction of wind energy by windmill. [7M]
- b) Explain the working of Wind Energy Conversion System (WECS) with main components. [7M]
6. a) Explain the basic components of Small hydroelectric scheme with a layout arrangement. [7M]
- b) Derive an expression for Power generated by a Tidal System. [7M]
7. a) Explain the principle of working of a $H_2 - O_2$ fuel cell. [7M]
- b) Explain about dry, wet and Hot water geo thermal systems? [7M]



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3. Answer any **FOUR** Questions from **Part-B**

PART -A

1. a) List the different forms of Renewable Energy sources. [2M]
- b) Enumerate the different types of Concentrating Solar collectors. [2M]
- c) Draw and explain briefly about equivalent circuit of a Solar cell. [2M]
- d) What are the relative features of drag and lift type machines in Windmills. [3M]
- e) List the difficulties in tidal power developments. [3M]
- f) Explain the various characteristics of Fuel cell. [2M]

PART -B

2. a) What do you understand by Solar radiation data? What is the need of Solar radiation data? [7M]
- b) Calculate the number of day light hours in Srinagar for 1 January and 1 July. [7M]
Take latitude of Srinagar as $34^{\circ}05'$ N.
3. a) Explain the significance of following factors in Flat Plate collectors: [7M]
i) Fin efficacy factor ii) Collector heat removal factor.
- b) Explain the working of a Solar furnace with the help of a neat sketch. [7M]
4. a) Explain the various factors contributing to losses in Solar cell. How is the efficiency reduced due to these factors. [7M]
- b) Explain the PV system configuration and signify the importance of the converter circuit and MPPT block in it. [7M]
5. a) Derive an expression for the total power of a wind stream taking in to all considerations m/sec, air density as. [7M]
- b) Find the maximum power output of a turbine if wind speed is 10 m/sec, air density as 1.4 Kg/m^3 and rotor diameter as 64 m. [7M]
6. a) List the advantages and limitations of Tidal power generation. [7M]
- b) Explain how the electric power is generated from hydro Power with necessary equations. [7M]
7. a) Explain the process of Single stage gasifier in detail. [7M]
- b) Compare between Geothermal Power plant and Conventional thermal Power plant. [7M]



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- ~~~~~

PART -A

1. a) List the various applications of PV system? [2M]
- b) Explain the working of a solar thermal pump. [2M]
- c) What do you understand by Valence band, Conduction band and Forbidden band w.r.t. a semiconductor. [2M]
- d) How can windmills be classified? [3M]
- e) List the advantages of Small hydro power. [3M]
- f) Explain the process of Photosynthesis. [2M]

PART -B

2. a) Define Solar constant. What are the reasons for variation in solar radiation reaching the earth and that received outside the earth atmosphere? [7M]
- b) Calculate the i) Zenith angle and ii) Solar azimuth angle for a place with latitude 43° at 9.30 AM solar time on Feb 13. [7M]
3. a) Explain the different factors that affect the performance of a Flat plate collector. [7M]
- b) A cylindrical parabolic concentrator is 9 m long and 2 m wide. The diameter of absorber tube is 10 cm. Find the concentration ratio. [7M]
4. a) Explain the current – voltage characteristics of a Solar cell and define Fill factor and give its significance. [7M]
- b) Explain the significance of Maximum Power Point Tracking and explain any one technique in detail. [7M]
5. a) List the main considerations for selecting a site for wind generator. [7M]
- b) Explain the variation of output of a wind turbine with tip speed ratio of the rotor. [7M]
6. a) Explain the different types of turbines that are used in Small scale hydroelectric power generation. [7M]
- b) What are the site requirements to construct a Tidal Power Plant? [7M]
7. a) List the advantages, disadvantages and environmental impacts of Biomass. [7M]
- b) What is meant by geothermal energy? Why it is called renewable energy? [7M]
 What are the deciding factors to use in power generation?



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

METAL CUTTING AND MACHINE TOOLS

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

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

PART -A

1. a) Determine the cutting speed and machining time per cut when the work having 40 mm diameter is rotated at 300 rpm. The feed given is 0.1mm/rev and length of cut is 65mm. [2M]
- b) Write a short note on four jaw independent chuck. [2M]
- c) How do you specify a Slotting machine? [2M]
- d) What is indexing head? What is importance in milling machine? [3M]
- e) How do you Specify a Grinding Wheel [3M]
- f) Write any two differences between jigs and fixtures. [2M]

PART -B

2. a) Explain the nomenclature of single point cutting tool. [7M]
- b) Prove that : $\tan \phi = \frac{r \cos \alpha}{1-r \sin \alpha}$ [7M]
3. a) How does the apron mechanism of a lathe works? Explain with the help of a neat diagram. [7M]
- b) How the sizes of Turret and Capstan lathes specified? [7M]
4. a) What is a 'twist drill'? Make a neat sketch of it and show different parts on it. [7M]
- b) A C.I. plate measuring 300mm×100mm×40mm is to be rough shaped along its wider face. Calculate the machining time take approach = 25mm; over travel = 25mm; cutting speed = 12m/min; return speed = 20m/min; allowance on either side of the plate width = 5mm and feed per cycle = 1 mm. [7M]
5. a) Sketch and describe a Vertical milling machine. [7M]
- b) Sketch and describe the following milling cutters. [7M]
 - i) Slab milling
 - ii) Face milling
 - iii) Staggered teeth side mill.
6. a) Write any seven advantages of center less grinding. [7M]
- b) Explain about reciprocating table type surface grinders. [7M]
7. a) What are the essential factors will you consider while designing a jig or fixture. [7M]
- b) Explain the working principle of CNC machine with neat sketch. [7M]



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(Mechanical Engineering)

Time: 3 hours

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**PART -A**

1. a) Determine the cutting speed and machining time per cut when the work having 25 mm diameter is rotated at 225 rpm. The feed given is 0.2mm/rev and length of cut is 55mm. [2M]
- b) Write a short note on angle plate used in lathe. [2M]
- c) How do you specify a Planning machine? [2M]
- d) Write any three differences between end milling and face milling. [3M]
- e) What are the natural abrasives used in grinding? Explain. [3M]
- f) Write the fundamental principles of jigs and fixtures. [2M]

**PART -B**

2. a) How is tool life influenced by the following factors? [8M]
  - i) Tool material ii) Workpiece material iii) Rigidity of the machine tool
  - (iv) Use of cutting fluids.
- b) List the common methods of chip breaking and what are the means used for the same. [6M]
3. a) Write any four operations that can be performed on a lathe machine with diagrams. [8M]
- b) What is a turret saddle? Describe its function in brief. [6M]
4. a) What is jig boring machine? With the help of a block diagram, describe the main features of a boring machine. [7M]
- b) How slotting machine is specified and write the main parts of a slotting machine. [7M]
5. a) Sketch and describe a Universal milling machine. [7M]
- b) Write a short note on the following milling operations. [7M]
  - i) End milling ii) Profile milling and iii) Gang milling.
6. a) Write a short note on rotary table type surface grinder. [7M]
- b) Why 'trueing' and 'dressing' are necessary in grinding wheels? Describe a few methods dressing an abrasive wheel. [7M]
7. a) What is the principle of 'six point location'? Explain. [7M]
- b) Write any seven applications of CNC machines. [7M]

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**PART -A**

1. a) Determine the cutting speed and machining time per cut when the work having 45 mm diameter is rotated at 350 rpm. The feed given is 0.18 mm/rev and length of cut is 75mm. [2M]
- b) Write a short note on Carriers or Dogs used in a lathe machine. [2M]
- c) How do you specify a Shaping machine? [2M]
- d) Explain slot milling operation with a diagram. [3M]
- e) What is super finishing? Write any three features of it. [3M]
- f) Write the essential features of jigs and fixtures. [2M]

**PART -B**

2. Draw Merchant's Circle Diagram and derive expressions to show the relationships among the different forces acting on a cutting tool and different parameters involved in metal cutting. [14M]
3. a) Explain taper turning by tail stock set over method with a neat diagram. [7M]
- b) Describe a single spindle bar automatic lathe in detail. [7M]
4. a) What are the common operations that can be performed on a drilling machine? Explain any four of them with neat diagrams. [7M]
- b) Explain the working of a hydraulic quick return mechanism of a shaper. [7M]
5. a) Sketch and describe about a Horizontal milling machine. [8M]
- b) Explain the working of a 'Universal dividing head 'with a diagram. [6M]
6. a) What is the use of cylindrical grinders? Explain the principle of cylindrical grinding. [7M]
- b) Write short notes on i) lapping ii) Honing. [7M]
7. a) What are the different types of locating pins you know? Illustrate and explain their uses. [7M]
- b) Explain about the construction features of CNC machine. [7M]

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**III B. Tech I Semester Regular Examinations, October/November - 2018****LINEAR IC APPLICATIONS****(Common to Electronics and Communication Engineering, Electronics and Instrumentation Engineering)**

Time: 3 hours

Max. Marks: 70

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**PART -A**

1. a) What does the term “balanced output” mean? [2M]
- b) Define CMRR. [2M]
- c) What is an instrumentation amplifier? [3M]
- d) What is all-pass filter? [2M]
- e) Draw the pin diagram of 555 Timer. [3M]
- f) Define resolution of a convertor. [2M]

**PART -B**

2. a) Derive the expression for voltage gain of a single input, balanced output differential amplifier. [7M]
- b) Draw the circuit diagram of two-stage differential amplifier and explain it. [7M]
3. a) Explain about integrated circuit package types. [7M]
- b) Explain the following: [7M]
  - i) Input offset voltage
  - ii) Input offset current.
4. a) Draw the circuit diagram of log amplifier and explain its operation. [7M]
- b) Design an op-amp differentiator that will differentiate an input signal with  $f_{\max} = 100$  Hz. [7M]
5. a) Design and plot the frequency response of a first order high pass filter for pass band gain of 2 and lower cut-off frequency of 2 KHz. . [7M]
- b) Explain the operation of Four-Quadrant Multiplier. [7M]
6. a) Draw the functional diagram of astable multivibrator using 555 timer and explain its operation. [7M]
- b) Derive the expression for lock in range. [7M]
7. a) Explain about IC 1408 D/A convertor. [7M]
- b) Explain about counter type A/D convertor. [7M]

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**PART -A**

1. a) Define differential amplifier? [2M]
- b) List out the temperature ranges for ICs. [2M]
- c) What is meant by buffer? [2M]
- d) Define band pass and band reject filter. [3M]
- e) List the basic building blocks of PLL. [3M]
- f) Write the significance of linearity in a convertor. [2M]

**PART -B**

2. a) Derive the expression for voltage gain of a dual input, unbalanced output differential amplifier. [7M]
- b) Draw the circuit diagram of level translator using emitter follower and explain it. [7M]
3. a) Draw the high frequency model of an op-amp with single break frequency and analyze the open loop voltage gain as a function of frequency. [7M]
- b) Explain the following: [7M]
  - i) Slew rate
  - ii) thermal drift.
4. a) Draw the circuit diagram of sample and hold circuit. Explain its operation. [7M]
- b) Find  $R_I$  and  $R_F$  in the lossy integrator so that peak gain is 20 dB and the gain is 3 dB down from its peak value when  $\omega = 10000$  rad/s. use a capacitance of 0.01  $\mu$ F. [7M]
5. a) Draw the circuit diagram of second order generalized active filter and derive the expression for transfer function. [7M]
- b) Design a second order Butterworth low-pass filter having a upper cut-off frequency of 1 kHz. [7M]
6. a) Draw the functional diagram of monostable multivibrator using 555 timer and explain its operation. [7M]
- b) Explain the following: [7M]
  - i) PLL used as Frequency translation
  - ii) PLL used as AM demodulator
7. a) Explain about weighted resistor DAC and write the drawbacks of it. [7M]
- b) Explain about successive approximation ADC. [7M]

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**PART -A**

1. a) What is level translator circuit? [2M]
- b) Define PSRR. [2M]
- c) List out the applications of comparator. [2M]
- d) Define notch filter. [2M]
- e) List out the applications of VCO. [3M]
- f) Find the resolution and dynamic range of a D/A convertor, if the maximum peak to peak output voltage is 5 V and the input signal is a 10 bit word. [3M]

**PART -B**

2. Draw the circuit diagrams of all four differential amplifier configurations and write the expressions for voltage gain, input resistance and output resistance. [14M]
3. a) Draw the block diagram of a typical op-amp and explain it. [7M]
- b) What is meant by an integrated circuit? Give the classification of ICs based on number of components integrated on the same chip. [7M]
4. a) Explain the operation of square wave generator using op-amp. [7M]
- b) Design an adder circuit using an op-amp to get the output expression as  $V_0 = - (0.1 V_1 + V_2 + 10 V_3)$ . [7M]
5. a) Draw the circuit diagram of first order high-pass filter using op-amp and explain its operation. [7M]
- b) Design a wide-band pass filter having  $f_l = 400$  Hz,  $f_h = 2$  kHz and a pass band gain of 4. Find the value of Q of the filter. [7M]
6. a) Explain the operation of FSK generator using 555 Timer. [7M]
- b) Draw the block diagram of 565 PLL and explain it. [7M]
7. a) Explain about R-2R DAC. [7M]
- b) Explain about Dual-Slope ADC. [7M]

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**III B. Tech I Semester Regular Examinations, October/November - 2018****LINEAR IC APPLICATIONS****(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**
- ~~~~~

**PART -A**

1. a) List out the four differential amplifier configurations. [2M]
- b) Write the difference between digital ICs and linear ICs. [3M]
- c) Draw the ideal and practical transfer characteristics of a comparator. [3M]
- d) Draw the Sample and Hold Circuit. [2M]
- e) Define capture range and lock in range. [2M]
- f) What is the difference between A/D and D/A convertor? Give one application of each one. [2M]

**PART -B**

2. a) Draw the circuit diagram of differential amplifier in common mode configuration and explain it. [7M]
- b) Derive the expression for input resistance and output resistance of a dual input, unbalanced output differential amplifier. [7M]
3. a) What is an operational amplifier? List out the ideal characteristics of operational amplifier. [7M]
- b) What is meant by frequency compensation? Explain about pole-zero compensation. [7M]
4. a) Explain the operation of triangular wave generator using op-amp. [7M]
- b) Explain about V to I convertor using op-amp. Write the applications of it. [7M]
5. a) Draw the circuit diagram of first order low-pass filter using op-amp and explain the operation. [7M]
- b) Design a second order Butterworth high-pass filter having a lower cut-off frequency of 1 kHz. [7M]
6. a) Draw the circuit diagram of Schmitt trigger using 555 timer and explain its operation. [7M]
- b) Give the block diagram of IC 566 VCO and explain its operation. [7M]
7. a) Explain about Inverted R-2R ladder DAC. [7M]
- b) Explain the important specifications of D/A and A/D convertors. [7M]

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

**UNIX PROGRAMMING**

(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. Answer **ALL** the question in **Part-A**  
 3. Answer any **FOUR** Questions from **Part-B**
- ~~~~~

**PART-A**

1. a) What is a System call in UNIX? [2M]
- b) What types of files are used to represent physical devices in UNIX file system? [2M]
- c) List out different types of Shell. [2M]
- d) Write a 'grep' command to print the lines that starts and ends with the word "UNIX". [3M]
- e) Explain the Purpose of *export* command. [3M]
- f) Mention the Tasks of background processes. [2M]

**PART -B**

2. a) What is UNIX? List out various versions of UNIX? [4M]
- b) Discuss the role of kernel in operating system. [4M]
- c) With a neat sketch, explain the directory structure of UNIX operating system. [6M]
3. a) Explain the implementation details of UNIX file system. [7M]
- b) Describe the attributes and permissions of a file in UNIX file system. [4M]
- c) Which command is used to change the file permissions in UNIX? Explain with an example. [3M]
4. a) What is a Shell? Explain the two different duties of a Shell. How can you create a sub shell? How can you move to the parent shell after creating a sub shell? [7M]
- b) What is Redirection? Explain the various commands used for redirection. [7M]
5. a) Define the *grep* family. Mention the primary difference between *fgrep* and the other two members of the *grep* family. [7M]
- b) With a neat diagram, describe an *awk* utility's view of a file and also explain the file buffers and record buffers of *awk*. [7M]
6. a) What is the use of 'eval' command in C shell and also explain the execution of 'eval' command with suitable example. [7M]
- b) Is it possible to pause the execution of a shell script for a specified time period? Give explanation. [7M]
7. a) Illustrate the syntax of *trap* command. [7M]
- b) Explain in sequence the steps to convert a background process to a foreground process. [7M]

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

## UNIX PROGRAMMING

(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. Answer **ALL** the question in **Part-A**  
 3. Answer any **FOUR** Questions from **Part-B**
- ~~~~~

**PART -A**

1. a) Difference between a System call and UNIX command. [3M]
- b) Which command will list the hidden files in UNIX? [2M]
- c) What is a Shell variable? [2M]
- d) Write the '*sed*' command to replace the pattern "SED" from the 7<sup>th</sup> occurrence to the end of file. [3M]
- e) What does *expr* do in a shell script? [2M]
- f) What is a background process in UNIX? [2M]

**PART -B**

2. a) With a neat sketch, explain the architecture of UNIX operating system. [7M]
- b) Explain the following UNIX commands [7M]  
 i) mkdir      ii) rm      iii) tar      iv) cat
3. a) What is the *inode* in UNIX? Where are inodes stored in UNIX file system? Explain. [7M]
- b) Explain the commands that are available in UNIX file system to change the permissions of a file. [7M]
4. a) What is an Environment variable? List out the common environment variables that control the user environment in Shell. [7M]
- b) Compare different loops used in Shell script [3M]
- c) Write a shell script to get current date, time, user name and current working directory. [4M]
5. a) What is *grep* command? Explain the operation of the grep command with a neat flowchart? And Illustrate the working of the grep command with a suitable example. [7M]
- b) Explain in brief various categories of *awk* patterns. [7M]
6. a) Explain the purpose of *set* command with an example. [7M]
- b) Write a Shell script describing integer and real arithmetic [7M]
7. a) What is a Child process? How it is created? Explain the relationship between parent process and child process. [8M]
- b) Explain the use of *stty* command along with its syntax. [6M]

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

**UNIX PROGRAMMING**

(Common to Computer Science Engineering and Information Technology)

Time: 3 hours

Max. Marks: 70

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- 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**
- ~~~~~

**PART -A**

1. a) List the Features of UNIX operating system. [3M]
- b) List the Fields of *aninode* structure in UNIX file system. [3M]
- c) What is the PATH environmental variable in UNIX? [2M]
- d) Is AWK a programming language? [2M]
- e) Give the Use of here document in shell script. [2M]
- f) What is the Syntax of Trap command. [2M]

**PART -B**

2. a) Compare and contrast library function, system call and Unix command. [7M]
- b) What is command substitution in a shell? Why is it important? Explain with an example. [7M]
3. a) What are Links and Symbolic links in UNIX file system? Explain. [7M]
- b) Explain the *chown* and *chgrp* commands in UNIX with an example. [7M]
4. a) Is it possible to pipe output of a command as an argument to a shell script? Justify your answer. [7M]
- b) Explain about various loop control statements of C shell with a sample example. [7M]
5. a) Define the '*sed*' utility? Give the format of the '*sed*' and Explain the operation of the '*sed*' utility with suitable diagrams. [7M]
- b) Explain the differences between grep and sed with a suitable example. [7M]
6. a) What are positional parameters? How a C shell script is invoked by passing parameters? Explain. [7M]
- b) How we know the exit status of a command in C shell? Explain. [7M]
7. a) Explain in detail about the internal and external commands in UNIX. [6M]
- b) What happens to the child process when the parent process kills/dies first? Explain with an example [8M]

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

**UNIX PROGRAMMING**

(Common to Computer Science Engineering and Information Technology)

Time: 3 hours

Max. Marks: 70

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- 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**
- ~~~~~

**PART -A**

1. a) How Unix is different from other Operating Systems? [2M]
- b) Interpret the command **chmod 644** [2M]
- c) In what way Shell variables are different from Environmental variables. [3M]
- d) Write a *sed* command to replace the word 'UNIX' with 'LINUX' in a given text file. [3M]
- e) What does \$# mean in shell script? [2M]
- f) Which command displays all current terminal settings? [2M]

**PART -B**

2. a) What is UNIX operating system? Explain various components of UNIX operating system. [7M]
- b) Is it possible to run multiple commands of UNIX in one time? Justify your answer with proper explanation. [7M]
3. a) Discuss the UNIX file structure and directories. [7M]
- b) Explain the format of *chmod* and *chown* commands in UNIX. [7M]
4. a) What are the advantages and disadvantages of Shell scripting? [5M]
- b) Write a Shell Script to display result based on the value returned from a function call. [9M]
5. a) Compare the three utilities of the grep family with a clear explanation [7M]
- b) List out the different string functions of *awk* utility and explain any three. [7M]
6. a) What are positional parameters in C shell scripting? Explain the meaning of the \$0, \$1, \$2, \${9}, \$\*, and \$#. [7M]
- b) List out the important uses of *exec* command in shell script. [3M]
- c) Write shell scripts to illustrate the use of continue and *break* statements. [4M]
7. a) Differentiate between Internal and External commands of UNIX. [9M]
- b) Explain the importance of *kill* command in UNIX with examples. [5M]

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**III B. Tech I Semester Supplementary Examinations, October/November - 2018**  
**DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES**

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

**Answer any ONE Question from Part – A and any THREE Questions from Part – B**  
**Use of IS: 456-2000 and design charts for Columns interaction diagrams only from SP-16 is allowed.**

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PART -A

- 1 Design a Reinforced concrete T-beam section supporting a continuous R.C slab at 4m center to centre. The effective length of simply supported T beam is 5m, thickness of slab 100mm, cross section of supporting beam 300 x 400mm (depth).The slab is carrying imposed load of 3kN/m^2 and dead load 2kN/m^2 . Use concrete grade M20 and HYSD steel reinforcement Fe415. [28M]
 Neatly sketch the detailing of reinforcement and apply relevant checks for design and serviceability conditions.

(OR)

- 2 Design a combined rectangular footing, supporting two R.C columns exterior and interior each size 300x300mm (steel 16mm 4nos) and 450x450mm (steel 16mm 6nos).The exterior and interior columns are carrying axial loads 150kN and 250kN respectively. The columns are spaced at centre to centre distance 3.2m. The width of footings restricted to 800mm and length of footing should not extend beyond the face of external column. Assume the allowable bearing pressure of soil 300kN/m^2 at 1.20m. Use concrete M25 and steel reinforcement Fe500. [28M]
 Neatly sketch the detailing of footing reinforcement and apply relevant checks for punching shear, flexure and anchorage requirements

PART -B

- 3 Find the cross sectional area of concrete and steel for a R.C simply supported rectangular beam of effective span 4m, carrying dead load 2kN/m and live load 4kN/m . Use concrete grade M20 and HYSD steel Fe415.(Use working stress method). Assume the following data. [14M]
 Steel young's modulus $E_s=2.1 \times 10^5\text{MPa}$, modular ratio $m=13$, clear cover=40mm.
- 4 A simply supported rectangular R.C beam 300x450mm depth, consist 4nos 16mm diameter tension reinforcement and 2nos 12mm diameter compression reinforcement at 30mm clear cover. Find out the moment capacity of beam if concrete grade M25 and HYSD steel Fe500 used. [14M]
- 5 A rectangular R.C beam of size 250x400mm reinforced with 4nos 12mm tensile steel and simply supported over an effective span of 4m subjected to total dead load 3kN/m , imposed load 8kN/m . Use M20 concrete, steel Fe415. Design the beam for shear reinforcement in combination of vertical stirrups and bent up bars. [14M]
- 6 A R.C roof slab of size 3x5m simply supported over four sides of 300mm thick wall and carrying dead load 2kN/m^2 and imposed load 4kN/m^2 . Design the slab for shear, bending and torsion. Use concrete M20 and HYSD steel Fe415. [14M]
- 7 Design the reinforcement of R.C square column 300x300mm size fixed at both ends over a clear height of 6m .The column carrying axial load 30kN and moment 2kN-m .Apply relevant design checks and neatly detail the reinforcement. Use concrete grade M25 and HYSD steel Fe500. [14M]



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

POWER SYSTEMS-II

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

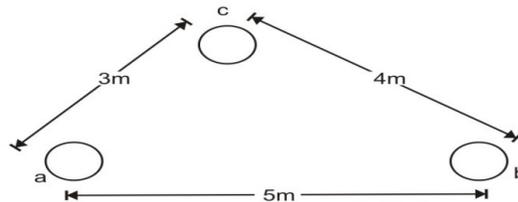
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) What are the merits of bundled conductors? [3M]
- b) Classify the transmission lines based on the operating voltages? [4M]
- c) Define surge impedance? Give the significance of SIL [4M]
- d) What are the differences between single frequency and double frequency transients in power systems? [4M]
- e) Discuss why the Ferranti effect is observed on a lightly loaded line? [4M]
- f) What are the various factors that are affecting the sag in the transmission lines? [3M]

PART -B

- 2 a) Derive the expression for the capacitance of a 3 phase over head line with un symmetrical spacing? [8M]
- b) Determine the inductance of each phase of a three-phase, 50Hz transmission line which has conductors of 2.0cm diameter. The distance between the three-phases are (i) 5 m between a and b, (ii) 4m between b and c and (iii) 3m between c and a as shown in below Figure. Assume that the phase conductors are transposed regularly. [8M]



- 3 A 3 phase 100km transmission line is delivering 150MW, 0.81 power factor lagging at 132kV. Each conductor is having resistance of 0.1 ohm/km and reactance of 0.3 ohms/km and admittance of 3×10^{-6} mho/km. If the load is balanced and leakage is neglected calculate the sending end voltage, sending end power factor, efficiency and regulation of the line by using nominal 'T' and nominal ' π ' representations? [16M]
- 4 a) Derive the transmission line constants by using complex angle method? [8M]
- b) A long transmission line which has resistance = 50 ohm, inductive reactance = 220 ohm and shunt admittance = 0.0025 S. Determine (i) sending end voltage, (ii) sending end current, (iii) sending end power factor and (iv) efficiency when the line is transmitting 40MVA at 0.85 p.f lagging at 220kV. [8M]



- 5 a) A cable has a conductor of radius 0.74 cm and a sheath of inner radius 2.5 cm. Find inductance per meter length, capacitance per meter length, surge impedance and velocity of propagation of transmitted wave? The permittivity of the insulation is 4. [8M]
- b) A surge of voltage 110kV is travelled by the line of surge impedance 500 ohms and reaches the junction of the line with two branch lines. The surge impedances of branch lines are 455 ohms and 55 ohms respectively. Find the transmitted voltage and currents, reflected voltage and currents? [8M]
- 6 a) What are various properties of corona and derive the expression for power loss due to corona? [8M]
- b) A 3-phase synchronous motor is connected in parallel with a load of 700 kW at 0.8 p.f. lagging. The synchronous motor has a total load of 125 kW and its excitation is so adjusted that the overall power factor becomes 0.9 lagging. Determine the kVA input to the motor and its power factor. Neglect motor losses [8M]
- 7 a) Explain the effect of ice loading and wind pressure on sag of a transmission line? [8M]
- b) Explain in detail about the pin type insulator with neat diagram and discuss its advantages, disadvantages? [8M]



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

DESIGN OF MACHINE MEMBERS – I

(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**
 (Data books may be allowed)

PART -A

- | | | | |
|---|----|--|------|
| 1 | a) | Write about types of fits? | [3M] |
| | b) | Differentiate the theoretical stress concentration factor and fatigue stress concentration factor. | [4M] |
| | c) | What do you mean by efficiency of riveted joint? | [3M] |
| | d) | Write the applications of sleeve and cotter joint? | [4M] |
| | e) | What is the importance of muff couplings? | [4M] |
| | f) | Write the applications of helical torsion springs? | [4M] |

PART -B

- | | | | |
|---|----|---|-------|
| 2 | a) | Explain the design considerations for the selection of Engineering Materials and their properties? | [8M] |
| | b) | Explain the concept of stiffness in tension, bending, torsion and combined situations? | [8M] |
| 3 | a) | Describe the modified Goodman's line theory for designing the components subjected to fatigue loads? | [6M] |
| | b) | A thin wall cylindrical pressure vessel of mean diameter of 60 cm is subjected to internal pressure varying from 0 to 40 MPa. Find the required thickness of the pressure vessel based on yield point of 400 MPa, endurance limit of 22 MPa, and a factor of safety of 3. Use Soderberg criterion of failure. | [10M] |
| 4 | a) | What forms of rivet heads are used in boiler construction? | [4M] |
| | b) | A triple riveted lap joint is to be made between 6 mm plates. If the safe working stresses are $f_t = 84$ MPa, $f_s = 60$ MPa and $f_c = 120$ MPa, calculate the rivet diameter, rivet pitch and distance between rows of rivets for the joint. Zig-zag riveting is to be used. State how the joint will fail. | [12M] |
| 5 | a) | A machinery shaft is subjected to torsion only. The bearings are 2.50 metre apart. The shaft transmits 190 kW at 220 rev/min. Allow a shear stress of 45 MPa after an allowance for keyways.
i) Calculate the shaft diameter for steady loading and
ii) Calculate the shaft diameter if the load is suddenly applied with minor shocks. | [12M] |
| | b) | Write the stresses in keys? | [4M] |



- 6 A bushed -pin type flexible coupling is used to connect two shafts and transmit 5kW power at 720 r.p.m. Shafts, keys and pins are made of commercial steel, ($\sigma_{yc}=\sigma_{yt} =240\text{N/mm}^2$) and the factor of safety is 3. The flanges are made of grey cast iron FG200 ($\sigma_{ut}=200\text{N/mm}^2$) and the factor of safety is 6. Assume, $\sigma_{sy}=0.55\sigma_{yt}$ and $\sigma_{su}=0.5 \sigma_{ut}$. There are 4 pins. The pitch circle diameter of the pins is four times of shaft diameter. The permissible shear stress for pins is 35 N/mm^2 . The permissible bearing pressure for rubber bushes is 1 N/mm^2 . The keys have square cross section. Calculate: [16M]
- i) diameter of shafts ii) dimensions of the key
iii) diameter of the pins iv) outer diameter and effective length of the bushes.
- 7 Design a spring for spring loaded safety valve for the following Conditions: [16M]
Operating pressure 100 N/cm^2 . Diameter of valve seat 100 mm. Design shear stress for the spring is 400 N/mm^2 , $G=0.86 \times 10^5 \text{ N/mm}^2$. The spring is to be kept in a casing of 120 mm inner diameter and 400 mm long. The spring should be at maximum lift of 6 mm when the pressure is 107.5 N/cm^2 .



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

(Common to Electronics and Communication Engineering and Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

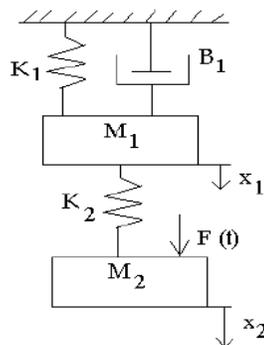
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

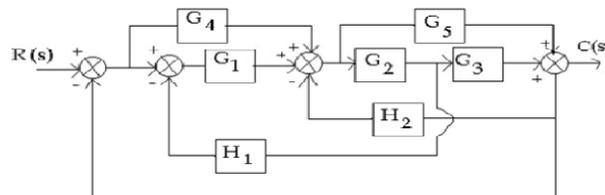
1. a) Explain advantages and disadvantages of positive and negative feedback in control system. [3M]
- b) What are the advantages and disadvantages of Block diagram Reduction technique. [4M]
- c) Explain PI and PD controller in time response of the system. [4M]
- d) By adding a poles and zeros to the system, How the stability will be affected in root loci. [4M]
- e) Explain Polar Plot for stability analysis. [3M]
- f) What are the advantages of state space analysis and define state space model. [4M]

PART -B

2. a) Explain the differences between open loop and closed loop control system and write the effects of Feedback in control systems. [8M]
- b) Write the dynamic equation in respect of the mechanical system given in Fig. [8M]
 Then using force-voltage analogy obtain the equivalent electrical network.



3. a) Derive the Transfer Function of DC Servo motor. [8M]
- b) Determine the transfer function $C(S)/R(S)$ for the block diagram shown in Fig below. [8M]



4. a) Derive the expressions for rise time, peak over shoot, settling time of Second order system of unit step input. [8M]
 b) A unit feedback system is characterized by an open-loop transfer function $G(s) = K/s(s+5)$. Determine the gain K so that the system will have a damping ratio of 0.5. For this value of K determine settling time, peak overshoot and times to peak overshoot for a unit-step input. [8M]
5. a) Explain different conditions for stability using RH criteria. [4M]
 b) Sketch the root locus diagram for a unity feedback system with its open loop function as $G(S) = \frac{K(S+3)}{S(S^2+2S+2)(S+5)(S+9)}$ Thus find the value of K at a point where the complex poles provide a damping factor of 0.5. [12M]
6. a) Sketch the Bode plot for the open loop transfer function [10M]

$$G(s) = \frac{10(S+3)}{S(S+2)(S^2+4S+100)}$$

 b) Explain how Polar plot is used to fine out the stability of the system. [6M]
7. a) What do you mean by state transition matrix? And give its properties [8M]
 b) The state equation of a linear time-invariant system is given below [8M]

$$\begin{bmatrix} \dot{X}_1 \\ \dot{X}_2 \end{bmatrix} = \begin{bmatrix} -2 & 0 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$$

Determine the following:

- i) State transition matrix ii) Controllability and observability of the system



III B. Tech I Semester Supplementary Examinations, October/November - 2018
PRINCIPLES OF PROGRAMMING LANGUAGES

(Computer Science and 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**

PART -A

- | | | | |
|---|----|---|------|
| 1 | a) | Define syntax and semantics of a language | [3M] |
| | b) | What mixed-mode assignments are allowed in C and Java? | [4M] |
| | c) | List the design issues for subprograms. | [4M] |
| | d) | Differentiate between statement level concurrency and subprogram level concurrency. | [4M] |
| | e) | Give the features of Scheme | [3M] |
| | f) | What are multi paradigm languages? | [4M] |

PART -B

- | | | | |
|---|----|---|------|
| 2 | a) | Briefly present milestones in the evolution of programming languages. | [8M] |
| | b) | Consider the grammar:
$\langle \text{assign} \rangle \rightarrow \langle \text{id} \rangle = \langle \text{expr} \rangle$
$\langle \text{id} \rangle \rightarrow A \mid B \mid C$
$\langle \text{expr} \rangle \rightarrow \langle \text{id} \rangle + \langle \text{expr} \rangle \mid \langle \text{id} \rangle * \langle \text{expr} \rangle \mid (\langle \text{expr} \rangle) \mid \langle \text{id} \rangle$
Give parse tree and left most derivation for $A = A * (B + (C * A))$ and $A = A * (B + (C))$. | [8M] |
| 3 | a) | Write about static variables, stack dynamic variables and heap dynamic variables. | [8M] |
| | b) | Present the classification of arrays based on subscript binding. Give programming examples. | [8M] |
| 4 | a) | Discuss about pass-by-value and pass-by-name parameter passing methods, with a detailed programming example for each. | [8M] |
| | b) | What is an Activation Record Instance? Explain different parts of it and implementation in the case of a recursive factorial function. | [8M] |
| 5 | a) | Differentiate between procedural and object oriented languages. | [8M] |
| | b) | Discuss about exception handling in C++. | [8M] |
| 6 | a) | Write about data types and structures in Scheme. | [8M] |
| | b) | Discuss about function declarations and control statements in ML. | [8M] |
| 7 | a) | What is the purpose of predicate calculus? How it helps in theorem proving? | [8M] |
| | b) | List and explain the applications of logic programming. | [8M] |



Code No: R31033

R10

Set No. 1

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

DYNAMICS OF MACHINERY

(Common to Mechanical Engineering and Auto Mobile Engineering)

Time: 3 hours

Max. Marks: 75

**Answer any FIVE Questions
All Questions carry equal marks**

- 1 a) Explain gyroscopic effect on pitching. [7M]
b) A disc with radius of gyration of 60mm and a mass of 4kg is mounted centrally on a horizontal axle of 80mm length between the bearings. It spins about the axle at 800rpm counter-clockwise when viewed from the right-hand side bearing. The axle processes about a vertical axis at 50rpm in the clockwise direction when viewed from above. Determine the resultant reaction at each bearing due to the mass and the gyroscopic effect. [8M]
- 2 a) Derive the expression for uniform wear and uniform pressure for flat collar. [7M]
b) In a thrust bearing the external and internal diameters of the contacting surfaces are 320mm and 200mm respectively. The total axial load is 80kN and the intensity of pressure is 350kN/m^2 . The shaft rotates at 400rpm. Taking the coefficient of friction as 0.06, calculate the power lost in overcoming the friction. Also find the number of collars require for the bearing. [8M]
- 3 a) The inner and outer radii of a single plate clutch are 40mm and 80mm respectively. Determine the maximum, minimum and average pressure when the axial force is 3kN. [7M]
b) What is self-energizing brake? Derive 'self-locking conditions' for a differential band brake when drum rotates in clockwise direction. [8M]
- 4 a) Explain the function of a flywheel from a crank effort diagram. [7M]
b) In a reciprocating engine, length of stroke is 30 cm and connecting rod is 60 cm long between centers. When the piston has travelled 8 cm from the inner dead Centre, find [8M]
i) angular position of the crank; ii) velocity and acceleration of the piston;
iii) Angular velocity of connecting rod, if the engine speed is 240 rpm.
- 5 For a spring controlled Hartnell type governor, following data is provided: [15M]
mass of the governor ball is 3 kg, length of the vertical arm of bell crank lever is 850 mm, and length of the other arm of bell crank lever is 95 mm. The speeds corresponding to radii of rotations 125 mm and 130 mm are 310 rpm and 320 rpm respectively. Determine the stiffness of spring.



Code No: **R31033**

R10

Set No. 1

- 6 a) Define and explain the term 'Balancing of Rotating Masses'. What will be the harm if the rotating parts of high speed engine are not properly balanced? [7M]
- b) Four masses A, B, C, D revolve at equal radii and are equally spaced along a shaft. The mass B is 7kg and the radii of C and D make angles of 90° and 240° respectively with the radius of B. Find the magnitude of the masses A, C, and D and the angular position of A so that the system may be completely balanced. [8M]
- 7 Derive the following expression of effects of partial balancing in two cylinder locomotive engine i) Variation of tractive force, ii) Swaying couple and iii) Hammer blow [15M]
- 8 In a single degree of damped vibration system a suspended mass of 8kg makes 30 oscillations in 18 seconds. The amplitude decreases in 18 seconds. The Amplitude decreases to 0.25 of the initial value after 5 oscillations. Determine i) the spring stiffness [15M]
ii) logarithmic decrement
iii) damping factor
iv) Damping coefficient.

