

## FACULTY OF ENGINEERING

B. E. 3/4 (Civil) II – Semester (Backlog) Examination, March/April 2021

Subject: Theory of Structures-II

Time: 2 hours

Max. Marks: 75

Note: Missing Data, if any, may be suitably be assumed.

## PART – A

Answer any seven questions.

(7x3=21 Marks)

- 1 What is absolute Maximum Bending Moment and where it occurs when a series of moving loads are travelling a girder from left to right.
- 2 Draw ILD of B.M at a section 5m from left end when a unit load is moving on a girder of 9m from left to right.
- 3 Explain the term EUDLL.
- 4 A parabolic cable of 50 m length, central dip 8 m is subjected to a udl of 15 kN/m over entire span. Find the Horizontal Thrust.
- 5 Explain how the effect due to temperature is considered in statically indeterminate trusses.
- 6 Develop the flexibility matrix for a beam element of length 'L' flexural rigidity 'EI'. Shown in fig(1).



Fig.1

- 7 Develop the stiffness matrix for a truss element of length 'L' and area of cross section 'A'.
- 8 What are the properties of Stiffness matrix?
- 9 What do you understand by Stiffening Girder?
- 10 What are the Limitations of STAAD Pro?

## PART – B

Answer any three questions.

(3x18 = 54 Marks)

- 11 A series of moving loads of magnitude 40 kN, 100 kN, 900 kN & 60 kN with 60 kN leading are moving on a girder of span 16m from left to right. The distances between these loads are 2.5m, 1.5m and 2.5m respectively. Find Absolute maximum S.F and Absolute maximum B.M in the girder.
- 12 Draw the ILD for the indicated members of the warren truss shown in Fig.(2).

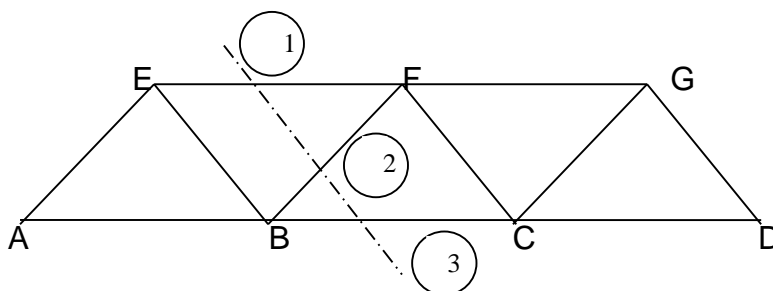


Fig.2

13 Analyze the Beam shown in Fig. (3) by Flexibility method.

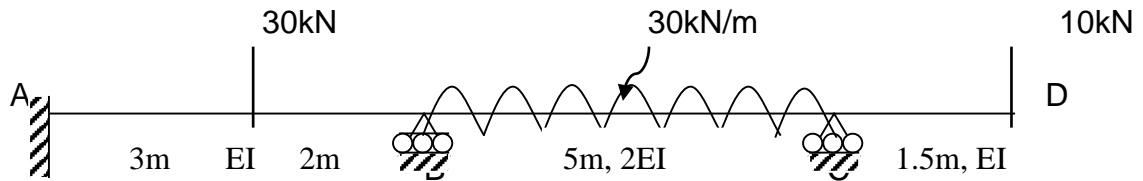


Fig.3

14 Analyze the truss shown in Fig.(4) using Stiffness method. Also find the forces in all the members of truss. Take  $AE$  constant for all members.

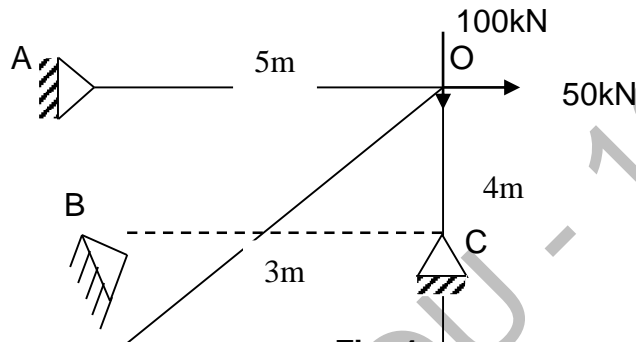


Fig. 4

15 A udl of intensity  $10\text{kN/m}$  spread over a length of  $4\text{ m}$  is moving on a girder of span  $18\text{ m}$  from left to right. Draw the curves of Bending moment and Shear force for the girder.

16 Find the maximum tension in the cable shown in Fig. (5).

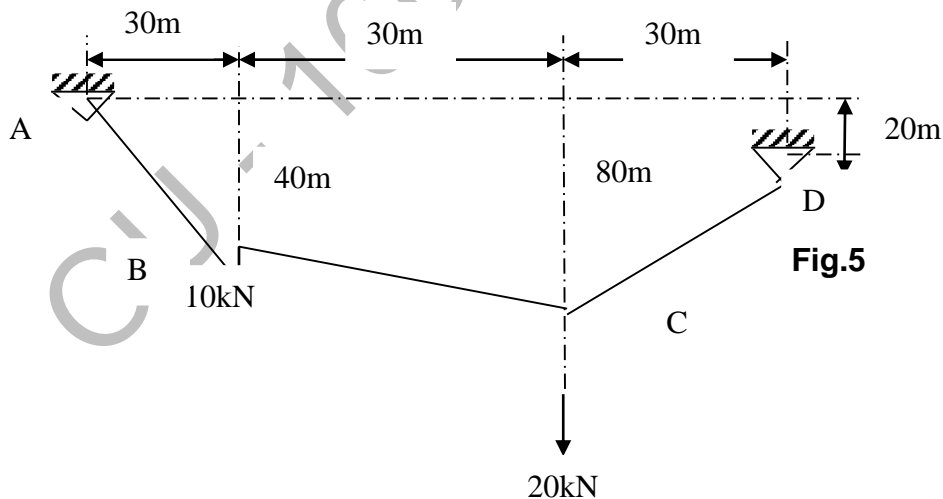


Fig.5

17 Write short notes on the following.

- Envelope of Parabola
- Lack of Fit in trusses.
- STAAD Pro Software for Analysis.

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**FACULTY OF ENGINEERING****B. E. 3/4 (EEE) II-Semester (Backlog) Examination, March/April 2021****Subject: Switch Gear and Protection****Time: 2 hours****Max. Marks: 75****Note: Missing Data, if any, may be suitably be assumed.****PART – A****Answer any seven questions.****(7x3=21 Marks)**

1. What is universal relay torque equation?
2. Classify the protective relays.
3. Define distance relay and also explain R-X diagram.
4. Compare Amplitude and Phase comparator.
5. What is magnetizing inrush current?
6. Mention different protection schemes for generator protection.
7. What is Resistance Switching?
8. Write the causes of over voltages.
9. Explain the importance of Ground Wire?
10. What is the difference between Surge absorber and surge diverter?

**PART – B****Answer any three questions.****(3x18 = 54 Marks)**

11. a) Derive the equation for the Torque developed by induction type relay.  
b) Explain the Protective scheme for the Parallel feeders.
12. With the help of neat diagram explain the construction, operation and applications of microprocessor based over current relay.
13. Discuss protection of generator against following faults
  - a) inter turn fault
  - b) Rotor over heating
  - c) Loss of excitation
14. Derive an expression of restriking voltage, RRRV and maximum RRRV.
15. a) With the help of neat diagram the construction and working of Expulsion type lightning arrester.  
b) What are the advantages and disadvantages of static relays compared to Electromechanical relays.
16. a) Discuss different over current protection schemes.  
b) In a system of 132KV, 3 phase, 50 Hz. The circuit phase to ground capacitance is 0.01  $\mu$ F, the inductance is Henry. Calculate
  - i) The maximum voltage which appears across the poles of a CB if a magnetizing current is 10 Amps (Instantaneous value) is interrupted. And also calculate
  - ii) The value of resistance to be used across the contacts to eliminate the restriking voltage.
17. Write short notes on any two of the following:
  - a) Tower footing resistance and its effects.
  - b) Minimum oil circuit breaker
  - c) Insulation Co-ordination.

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**FACULTY OF ENGINEERING**

**B. E. 3/4 (Inst.) II Semester (Backlog) Examination, March/April 2021**

**Subject: Power Plant Instrumentation**

**Time: 2 hours**

**Max. Marks: 75**

**Note: Missing Data, if any, may be suitably be assumed.**

**PART – A**

**Answer any seven questions.**

**(7x3=21 Marks)**

- 1 What is meant by draught in TPP?
- 2 Draw the P&I diagram of Excess air control.
- 3 Explain the basic principle involved in Nuclear power plant.
- 4 What are non-conventional energy sources?
- 5 Draw the block diagram of TSI.
- 6 What are the different types of glands used in steam exhaust control?
- 7 What is meant by feed water conditioning?
- 8 How many types of condensate systems are present in TPP?
- 9 What is the basic difference between three element and Two element Drum level control?
- 10 What is meant by "Attemperation"?

**PART – B**

**Answer any three questions.**

**(3x18 = 54 Marks)**

- 11 a) With a neat diagram explain the boiler following mode?  
b) Write briefly about Fan drives and Control in TPP?
- 12 With a neat diagram explain hydrogen generator cooling system?
- 13 With a neat diagram explain the power generation in Nuclear power Plant (NPP) and explain the importance of control rods in NPP?
- 14 a) With a neat diagram explain smoke and dust monitoring?  
b) Discuss about Flame monitoring?
- 15 With a neat diagram explain power generation using thermal power Plant?
- 16 Explain with a process diagram the fuel-air ratio control and discuss about O<sub>2</sub> trimming methods?
- 17 Write short notes on:
  - a) Steam circuits
  - b) Condenser vacuum control
  - c) Principle of Hydro electric power generation

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**FACULTY OF ENGINEERING****BE 3/4 (ECE) II Semester (Backlog) Examination, March/April 2021****Subject: Antennas and Wave Propagation****Time: 2 hours****Max. Marks: 75****Note: Missing Data, if any, may be suitably be assumed.****PART – A****Answer any seven questions.****(7x3=21 Marks)**

- 1 What is an Isotropic Radiator and write the formula for average power density.
- 2 Define Effective Aperture of an Antenna with necessary equations.
- 3 What are the major parameters to be considered in the design of an Helical antenna
- 4 Calculate the radiation resistance of an Antenna which is drawing 15 amp current and radiating at 6KW.
- 5 Why Yagi-Uda antenna is called Super-Directive antenna?
- 6 Mention the advantages and disadvantages of rhombic antenna.
- 7 Differentiate between Uniform array and a Linear array.
- 8 Write Hansen-Woodyard conditions for end-fire radiation for both  $\phi=0$  degrees and  $\phi= 180$  degrees.
- 9 Write the formulas for transmission path loss.
- 10 Define Skip Distance and Maximum Usable frequency.

**PART – B****Answer any three questions.****(3x18 = 54 Marks)**

- 11 a) With necessary equations derive the expression for noise power and noise temperature of antenna.  
b) The radiation efficiency of a certain antenna is 95%. The maximum radiation intensity is 0.5 W/sr. Calculate the directivity of the antenna if  
i)  $P_{\text{input}} = 0.4 \text{ W}$     ii)  $P_{\text{rad}} = 0.3 \text{ W}$
- 12 Show that the radiation resistance of a quarter wave monopole is  $36.5\Omega$ .
- 13 a) What is a Log-Periodic antenna and also Show that it is a Frequency dependent antenna?  
b) List all the precautions to be taken while conducting antenna measurements.
- 14 a) Using the Principle of Pattern Multiplication describe the radiation characteristics of Binomial array.  
b) Differentiate between Broadside and end fire arrays.
- 15 a) Give the Structure of Ionosphere and explain the mechanism of sky wave Propagation.  
b) Discuss about ionospheric abnormalities.
- 16 a) Explain the cassegrain feeding of Paraboloid reflector and its advantages.  
b) Calculate the directivity in dB for the broadside as well as end fire array consisting 8 isotropic elements separated by  $\lambda/4$  distance.
- 17 Write short notes on  
a) Ground wave propagation.  
b) Friss Transmission formula.

**FACULTY OF ENGINEERING**  
**BE 3/4 (Mech./AE) II-Semester (Backlog) Examination, March/April 2021**

**Subject: CAD / CAM**

**Time: 2 hours**

**Max. Marks: 75**

**Note: Missing Data, if any, may be suitably be assumed.**

**PART – A**

**Answer any seven questions.**

**(7x3=21 Marks)**

- 1 Define each term CAD, CAM and CAE.
- 2 What is the importance of Bezier curve in CAD/CAM?
- 3 Show transformation matrix for rotation and shearing.
- 4 List the properties of Bezier surface.
- 5 Explain how CAD data is exchanged.
- 6 What are M codes? List any four with its meaning.
- 7 What are the elements of NC system?
- 8 What do you mean by work volume of a robot?
- 9 What is the importance of part coding system in manufacturing industry?
- 10 Explain additive manufacturing in brief.

**PART – B**

**Answer any three questions.**

**(3x18 = 54 Marks)**

- 11 (a) What is product lifecycle? Explain with sketch the role of CAD/CAM and CAE.  
 (b) Generate a Bezier curve using the following control points.  
 $P_0(2,0)$ ,  $P_1(4,3)$ ,  $P_2(5,2)$  and  $P_3(4,-2)$ ,  $P_4(5,-3)$  and  $P_5(6,-2)$ .
- 12 (a) Explain B-REP and C-Rep approach of solid modeling with examples.  
 Write CSG tree for figure 1.

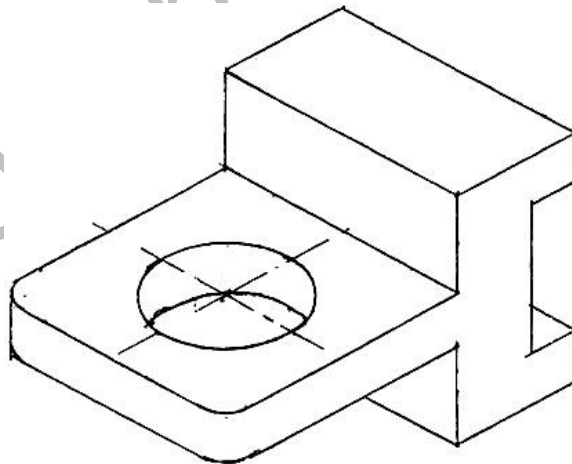


Figure 1

- (b) A triangle A (0,0), B(1,1) and C(5,2) is rotated by an angle of  $45^\circ$  about  
 (i) the origin and (ii) about point (-1,-1). Find the new co-ordinates of the triangle.

..2..

- 13 (a) Distinguish Tab sequential format and Word address format in manual part Programming with example.  
 (b) What is cutter radius and length compensation?
- 14 Develop a manual part program for a given fig. 2. All dimensions are in mm. The holes are to be drilled using a 10 mm diameter drill at 500 rpm and federate of 200 mm/min.

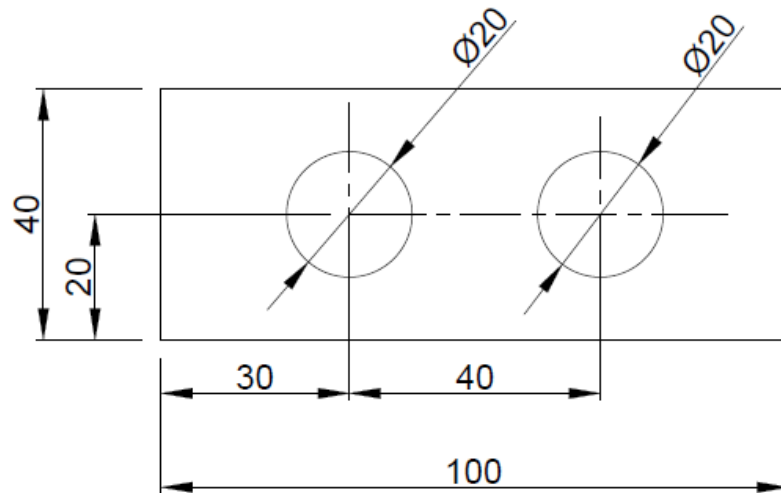


Figure 2

- 15 (a) What is DNC? Explain BTR and SMCU systems of DNC.  
 (b) What is CMM? Explain four types of CMM with neat sketch.
- 16 (a) Explain various types of Robot drives and programming methods.  
 (b) What is FMS? Discuss elements and control of FMS.
- 17 (a) Show various types of non-contact inspection methods.  
 (b) Explain any one method of rapid prototyping with neat sketch.

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**FACULTY OF ENGINEERING**  
**BE 3/4 (Prod.) II-Semester (Backlog) Examination, March/April 2021**

**Subject: Turbo Machinery**

**Time: 2 hours**

**Max. Marks: 75**

**Note: Missing Data, if any, may be suitably be assumed.**

**PART – A**

**Answer any seven questions.**

**(7x3=21 Marks)**

- 1 Define turbo machine and how they are classified
- 2 Explain energy transfer phenomena in turbo machines.
- 3 Define specific speed of pump. Also write its expression.
- 4 What are the merits and demerits of axial flow compressor over centrifugal compressor?
- 5 Define gross head, net head and efficiency of turbine.
- 6 Differentiate between Francis and propeller turbine.
- 7 Briefly explain velocity compounding in steam turbines.
- 8 What is the function of a steam nozzle?
- 9 What is a gas turbine? How it differs from a steam turbine?
- 10 List out the applications of gas turbines.

**PART – B**

**Answer any three questions.**

**(3x18 = 54 Marks)**

- 11 (a) Find an expression for the efficiency of a moving curved vanes when a jet of water strikes at centre of the vane?  
 (b) A jet of water of diameter 50 mm moving with a velocity of 20 m/s strikes a fixed plate in such a way that the angle between the jet and the plate is  $60^\circ$ . Find the force exerted by the jet on the plate (i) in the direction normal to the plate (ii) in the direction of jet.
- 12 A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1200 rpm works against a total head of 75 m. The velocity of flow through the impeller is constant and equal to 3 m/s. The vanes are set back at an angle of  $30^\circ$  at outlet. If the outer diameter of the impeller is 600 mm and width at outlet is 50 mm, determine (a) Vane angle at inlet, (b) Work done per second by impeller, (c) Manometric efficiency.
- 13 (a) Explain with neat sketch, the working principal of centrifugal pump.  
 (b) List out the merits and demerits centrifugal pump.
- 14 A Pelton wheel is to be designed for the following specification. Power = 735.75 kW, S.P Head= 200 m, speed = 800 rpm,  $\eta_o = 0.86$  and jet diameter is not to exceed one-tenth the wheel diameter. Determine: (i) Wheel diameter, (ii) The number of jets required and (iii) Diameter of the jet. Take  $C_v = 0.98$  and speed ratio = 0.45.
- 15 (a) Explain the working principle of Kaplan turbine with the help of neat Sketch.  
 (b) Differentiate between steam and gas turbines.
- 16 In a simple impulse steam turbine the nozzles are inclined at  $20^\circ$  to the direction of motion of the moving blades. The steam leaves the nozzle at 375 m/s. The blade speed is 165 m/s, Find suitable inlet and outlet angles for the blades in order that the axial thrust is zero. Determine also the power developed for a flow rate of 10 kg/s.
- 17 (a) Difference between inward and outward radial flow reaction turbine.  
 (b) Methods of improving thermal efficiency of a steam turbine power plant.



## FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II-Semester (Backlog) Examination, March/April 2021

Subject : Compiler Construction

Time : 2 Hours

Max. Marks: 75

Note: Missing Data, if any, may be suitably be assumed.

## PART – A

Note: Answer any Seven Questions

(7x3 = 21Marks)

1. Define lexeme, Token, Pattern?
2. List out the phases of compiler?
3. Define left most derivation with an example?
4. What is ambiguous grammer?
5. What is YACC?
6. Among all LR parser which parser is powerful and why?
7. What is Abstract syntax Tree?
8. List the various types of Intermediate code Representations?
9. List the properties of data flow analysis?
10. What is DAG?

## PART – B

Note: Answer any Three Questions

(3x18 = 54Marks)

- 11 Explain the phases of Compiler with example
12. Find FIRST and FOLLOW for the following grammer and construct LL (!) paesing table
 
$$S \rightarrow ABC \mid Ba \mid Cd$$

$$A \rightarrow et \mid$$

$$B \rightarrow gh \mid d$$

$$C \rightarrow d \mid e \mid$$
13. Construct the SLR parsing table for the below given grammer
 
$$E \rightarrow E + T \mid T$$

$$T \rightarrow T * F \mid F$$

$$F \rightarrow id$$
14. Explain the data structures for implementing symbol table?
15. Translate the expression  $a+a * (b-c) + (b - c) *d$  into quardruples, triples and indirect triples?
16. Explain peephole optimization with examples?
17. Explain Run time storage organization in detail?

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**FACULTY OF ENGINEERING****BE 3/4 (IT) II-Semester (Backlog) Examination, March/April 2021****Subject : Compiler Construction****Time : 2 Hours****Max. Marks: 75****Note: Missing Data, if any, may be suitably be assumed.****PART – A****Note: Answer any Seven Questions****(7x3 = 21Marks)**

1. What is the difference between compiler and cross-compiler?
2. Write about scanning process.
3. Define symbol table. Give example
4. Explain about type checking.
5. What is syntax diagram? Give example.
6. Write rules to construct first and follow sets.
7. Draw and explain general form of activation record.
8. What is activation tree?
9. Define intermediate code. For the expression  $a=b*c+d$
10. Draw DAG for the following expression  $a=b*-c+b*-c$ .

**PART – B****Note: Answer any Three Questions****(3x18 = 54Marks)**

11. Consider the following regular expression  $(a+b)^*a$ . Convert it into DFA using Thompson's method.
12. Explain with example about code generation for control statements and function calls.
13. Write in detail about stack-based run-time environment.
14. Write about
  - a) Error recovery in bottom-up parsers.
  - b) Semantic analyzer of TINY language.
15. Explain the concept of RD parser in detail with an example.
16. a) Write about quadruples, triples along with example.  
b) Explain general structure of LEX program.
17. Write short notes on
  - a) Data structures for code generation.
  - b) CFG.
  - c) Annotated parse tree.

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**FACULTY OF ENGINEERING**  
**BE VI - Semester (CE) (CBCS) (Backlog) Examination, March / April 2021**

**Subject: Theory of Structures-II**

**Time: 2 Hours**

**Max .Marks: 70**

**Note: Missing data, if any, may be suitably assumed**

**PART – A**

**Answer any five questions.**

**(5x2=10 Marks)**

- 1 What is influence line diagram? Explain its uses.
- 2 A uniformly distributed moving load of intensity 20kN/m dispersed over a length of 5m is crossing a bridge of span 18m from left to right. Calculate the EUDL for BM.
- 3 Write the condition of absolute maximum BM and absolute maximum S.F when a series of concentrated loads are crossing a bridge.
- 4 Explain the term focal length of a beam.
- 5 Draw the ILD for a top chord member of a two panel warren truss of span 12m.
- 6 A parabolic cable of 100m length, central dip 15m is subjected to a UDL of 10 kN/m over entire span. Find the horizontal thrust.
- 7 Develop the flexibility matrix for a beam element of length 'l' flexural rigidity 'EI'. Shown in fig (1).



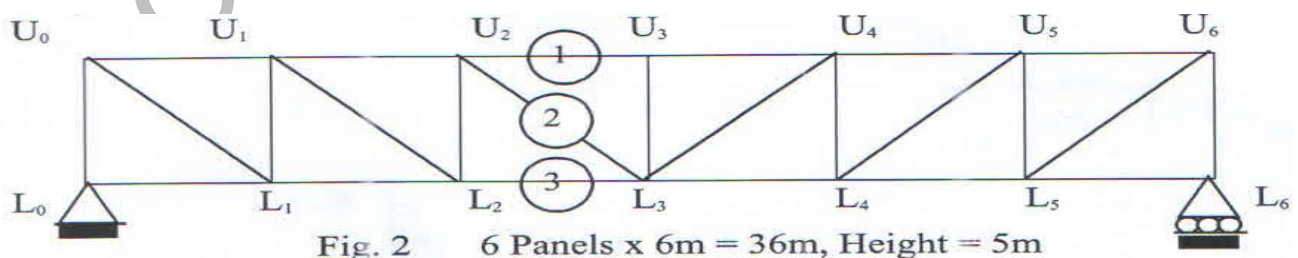
- 8 What are the properties of stiffness matrix?
- 9 Using direct element method develop the stiffness matrix for a two span continuous beam.
- 10 What are the uses and limitations of STAAD pro software?

**PART – B**

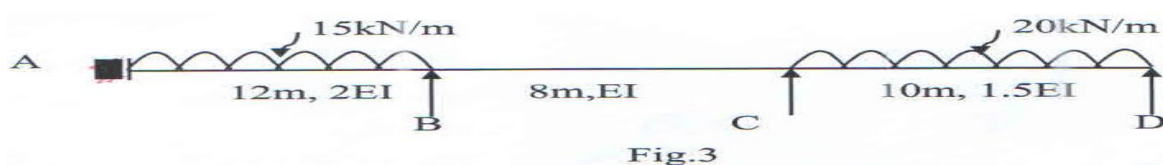
**Answer any four questions.**

**(4x15= 60 Marks)**

- 11 A series of moving loads of magnitude 40kN, 100kN, 120kN & 60kN with 40kN leading are moving on a girder of span 22 m from left to right. The distances between these loads are 2.5 m, 1.5 m and 2 m respectively. Find maximum B.M and maximum S.F at section located at a distance of 7m from left end. Also find the absolute maximum B.M
- 12 Draw the ILD for the indicated members of the truss shown in Fig.(2).

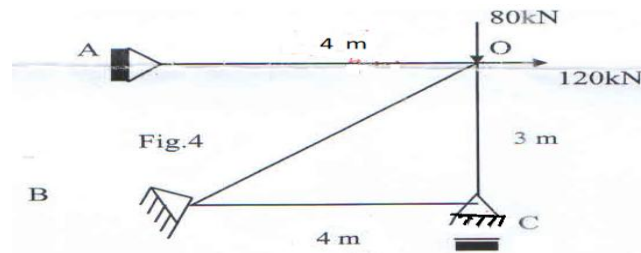


- 13 Analyze the beam shown in fig. (3) by flexibility method. Support B and C sinks by  $100/EI$  and  $80/EI$  respectively.



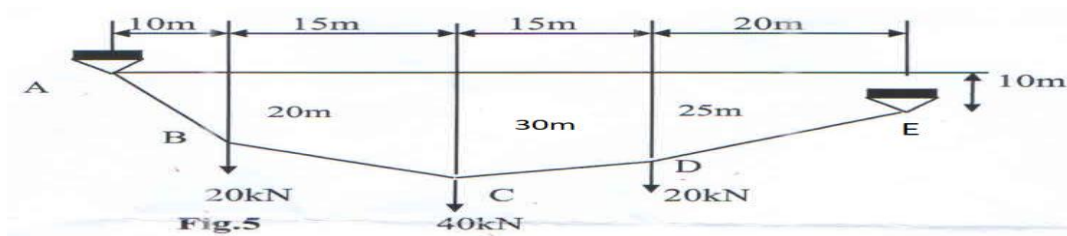
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- 14 Analyze the truss shown in fig.(4) using stiffness method. Also find the forces in all the members of truss. Take  $AE$  constant for all members.

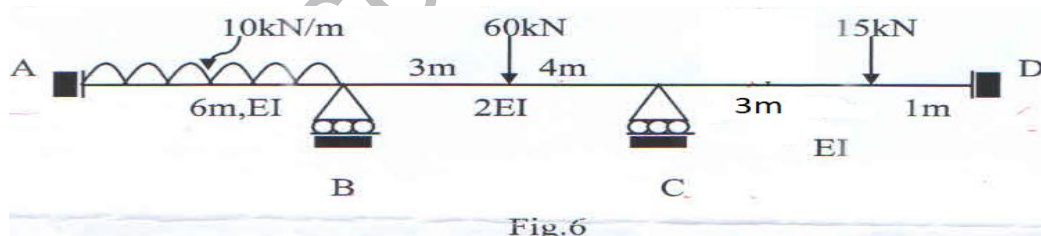


- 15 Two concentrated loads of magnitude 80 kN and 100 kN spaced at 4 m with 100 kN leading is moving on a girder of span 18 m from left to right. Draw the curves of bending moment and shear force for the girder.

- 16 Find the maximum tension in the cable shown in Fig.(5)



- 17 Using direct stiffness method analyze the beam shown in Fig. (6)



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**FACULTY OF ENGINEERING**  
**BE VI - Semester (EEE) (CBCS) (Backlog) Examination, March / April 2021**

**Subject: Switch Gear and Protection**

**Time: 2 Hours**

**Max .Marks: 70**

**Note: Missing data, if any, may be suitably assumed**

**PART – A**

**Answer any five questions.**

**(5x2=10 Marks)**

- 1 Explain primary and backup protection.
- 2 Define: (i) Pick-up value (ii) TSM?
- 3 Explain the operating principle of impedance relay.
- 4 Mention advantages of using microprocessor based relay.
- 5 What is magnetizing inrush current?
- 6 What is buchholz relay?
- 7 What is resistance switching?
- 8 For a 132 KV system, the reactance and capacitance up to the location of the circuit breaker is  $3\Omega$  and  $0.015\mu F$  respectively. Calculate the frequency of transient oscillation.
- 9 Define protective angle.
- 10 What are the de-merits of gas insulated substations over conventional air insulated substations.

**PART – B**

**Answer any four questions.**

**(4x15= 60 Marks)**

- 11 (a) Derive an expression for torque developed in induction relay.  
 (b) With a neat diagram explain the protective scheme for ring mains.
- 12 (a) Explain 3-zone protection of lines.  
 (b) What is amplitude comparator? How it can be converted to phase comparator?
- 13 (a) Explain the protection of transformer using buchholz's relay.  
 (b) Explain protection of generator against loss of excitation.
- 14 (a) With the help of neat diagram explain the operation of expulsion type lightning arrestors.  
 (b) Explain in detail about insulation coordination.
- 15 (a) Explain construction and working principle of SF<sub>6</sub> circuit breaker with neat diagram.  
 (b) Discuss two methods of arc interruption in circuit breakers.
- 16 (a) Obtain following relay characteristics on R-X diagrams  
 (i) Reactance relay (ii) Mho relay  
 (b) Explain the protection of overhead transmission lines using ground wires?
- 17 (a) With a neat diagram explain construction and working of induction type directional over-current relay.  
 (b) Write a short note on testing of circuit breaker.

**FACULTY OF ENGINEERING**  
**BE VI - Semester (EIE) (CBCS) (Backlog) Examination, March / April 2021**

**Subject: Process Control**

**Time: 2 Hours**

**Max .Marks: 70**

**Note: Missing data, if any, may be suitably assumed**

**PART – A**

**Answer any five questions.**

**(5x2=10 Marks)**

- 1 Define system function.
- 2 A flow head device has an equation  $q=\lambda^n$  calculate the resistance
- 3 Write the expression of single speed floating control mode.
- 4 What are the different signal transmission standards in process industries?
- 5 What is steady state velocity error?
- 6 What are the effects of P+1 controller on single time constant process?
- 7 What is an actuator?
- 8 Find the proper  $C_v$  for a valve that must allow 150 gal of ethyl alcohol per minute with a specific gravity of 0.8 at maximum pressure of 50 psi
- 9 Explain the role of timers in PLC processing.
- 10 Draw the ladder diagram logic for NOR gate.

**PART – B**

**Answer any four questions.**

**(4x15= 60 Marks)**

- 11 With a neat diagram, explain about interacting system and also find its transfer function.
- 12 Explain P+I+D controller operation. Write all the relevant equations and graphical interpretation. Also obtain OP-AMP realization.
- 13 Explain clearly about open loop transient response method.
- 14 (a) Explain in detail about ON-OFF controller.  
(b) With neat diagram, explain about current to pressure converter.
- 15 (a) Explain in detail about characteristics of control valve.  
(b) An equal percentage valve has a maximum flow of 50 cm<sup>3</sup>/sec and a minimum of 2 cm<sup>3</sup>/sec. if the full travel is 3 cm, find the flow at a 1-cm opening.
- 16 Draw the block diagram of PLC and explain its principle of operation.
- 17 Write short notes on:
  - (a) Characteristics of physical system
  - (b) Solenoid valve
  - (c) Discrete state process control

**FACULTY OF ENGINEERING**  
**BE VI - Semester (ECE) (CBCS) (Backlog) Examination, March / April 2021**

**Subject: Antennas & Wave Propagation**

**Time: 2 Hours**

**Max .Marks: 70**

**Note: Missing data, if any, may be suitably assumed**

**PART – A**

**Answer any five questions.**

**(5x2=10 Marks)**

- 1 Compare gain and directivity?
- 2 Define retarded potential?
- 3 Give the expression for the Radiation resistance of a dipole antenna?
- 4 What is a slot antenna?
- 5 What is Huygens' Principle?
- 6 Name the different types of beam forming methods in smart antennas?
- 7 What is an antenna array? Also write its objective?
- 8 List out the sources of errors in antenna measurements?
- 9 Mention the frequency ranges of different modes of wave propagation?
- 10 Give the heights of different sub-layers of the ionosphere?

**PART – B**

**Answer any four questions.**

**(4x15= 60 Marks)**

- 11 (a) Write short notes on (i) Antenna field regions (ii) Antenna temperature  
(b) Derive Friji's transmission equation?
- 12 With a neat diagram explain the principle of working a helical antenna? Also compare the normal mode and axial modes of operation?
- 13 (a) Describe the characteristics of a micro-strip antenna? Also draw a neat diagram?  
(b) Determine the gain of a paraboloid reflector antenna operating at a frequency of 12 GHz with a diameter of 8m and having an illumination efficiency of 65%?
- 14 (a) Distinguish between broadside antenna array and an end-fire antenna array with neat diagrams?  
(b) Write a short notes on the different radiation hazards in antenna measurements?
- 15 With necessary mathematical expressions and neat diagrams explain in detail about the reflection and refraction phenomenon in the troposphere?
- 16 (a) Write s short notes on the reciprocity principle of the antennas?  
(b) Discuss the wideband characteristics of a helical antenna?
- 17 (a) What is Babinet's principle? Discuss the design considerations of a horn antenna?  
(b) Write short notes on Binomial antenna array?

**FACULTY OF ENGINEERING****BE VI Semester (CBCS) (Mech.) (Backlog) Examination, March/April 2021****Subject: Hydraulic Machinery & Systems****Time: 2 hours****Max. Marks: 70****Note: Missing Data, if any, may be suitably be assumed.****PART – A****Answer any five questions.****(5x2 = 10 Marks)**

1. A pelton wheel is ideally suited for
 

(a) High head and low discharge	(b) High head and high discharge
(c) Low head and low discharge	(d) Medium head and medium Discharge
2. High specific speed (300 to 1000) and low heads (below 30 m) indicate that the turbine is
 

(a) Pelton wheel	(b) Francis
(c) Kaplan	(d) Propeller
3. Which of the following pump is suitable for small discharge and high heads?
 

(a) Centrifugal pump	(b) axial pump
(c) Mixed flow pump	(d) reciprocating pump
4. In a double acting reciprocating pump, if  $C_d=0.95$ , then the % slip is
 

(a) 5%	(b) 10%
(c) 7.5%	(d) 2.5%
5. The velocity of a  $0.08 \text{ m}^3/\text{sec}$  jet of water impinging on a fixed flat vertical vane and Exerts a force of 4000 N, is (m/sec).
 

(a) 50	(b) 0.223
(c) 36	(d) 60
6. In a single acting reciprocating pump, if the % slip is 2%, then  $C_d$  is
 

(a) 0.92	(b) 0.98
(c) 0.96	(d) 0.94
7. The pump is required to deliver 150 lit./s at head of 45m when running at 1750 rpm. The specific speed of pump is
 

(a) 18	(b) 125
(c) 39	(d) 1260
8. The water turbines may be arranged in the following decreasing order of specific speed as,
 

(a) Propeller, Francis and Pelton	(b) Pelton, Francis , Kaplan
(c) Kaplan, Pelton , Francis	(d) Francis, Kaplan and Pelton
9. For a model and prototype turbine the following parameters are common
 

(a) unit speed	(b) unit discharge
(c) unit power	(d) all the above



10. The type of turbine used if the head is 152m, to develop 1500 KW, while running at 300rpm is
- (a) Pelton Wheel  
(b) Francis turbine  
(c) Kaplan Turbine  
(d) None of the above

**PART – B****Answer any four questions.****(4x15 = 60 Marks)**

11. A jet of water 9cm in diameter and moving with a velocity of 29m/s is impinging normally on a plate. Determine the pressure on the plate when the plate is fixed and plate is moving with velocity 14m/s in the direction of jet .Also determine the work done per second by the jet.
12. a) Differentiate between centrifugal pumps and reciprocating pumps.  
b) Write about the Indicator diagrams of reciprocating pumps.
13. A Centrifugal Pump delivers water under a head of 14.5 m at a speed of 1000 rpm. The vane angles at outlet tip are  $30^\circ$ . The impeller diameter and width at outlet are 300 mm and 50 mm respectively. If the manometric efficiency of the pump 95%, Find the discharge of the pump.
14. Draw a neat sketch of pelton wheel and explain.
15. A Kaplan turbine produces 9100KW of power under a head of 5.6m with  $\eta_{\text{overall}}$  of 85%. If the speed ratio = 2.09 & flow ratio = 0.68. Find the diameter of runner.  
Speed of the runner and specific speed of the turbine. Take the hub diameter=0.35 times the runner diameter.
16. Describe the working and construction details of single acting and double acting actuator.
- 17.a) Explain the characteristic curves of Hydraulic turbines.  
b) Explain the unit quantities in turbines.

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**FACULTY OF ENGINEERING****B.E. VI-Semester (CBCS) (Prod.) (Backlog) Examination, March/April 2021****Subject : Modern Machining & Forming Methods****Time: 2 hours****Max. Marks: 70****Note: Missing Data, if any, may be suitably be assumed.****PART – A****Answer any five questions.****(5x2 = 10 Marks)**

- 1 List the various process parameters of Abrasive Jet Machining.
- 2 What are the abrasive materials used in USM.
- 3 Enlist the various flushing mechanisms adopted in EDM.
- 4 Describe briefly the principle of hot machining process.
- 5 What are the advantages of LBM?
- 6 Briefly explain the principle involved in PAM.
- 7 What are the explosive materials used in explosive forming.
- 8 What are the advantages and limitations of Electro-Hydraulic forming?
- 9 Enlist the equipment and accessories used in stretch forming process.
- 10 Write the applications of Water Hammer Forming

**PART – B****Answer any four questions.****(4x15 = 60 Marks)**

- 11 a) What is ultrasonic machining? Explain the working principle and operation with a neat sketch.  
b) Explain the influence of abrasive flow rate and mixing ratio on MRR in Abrasive Jet Machining process.
- 12 a) Explain the working principle, advantages and applications of Electrochemical milling process.  
b) Discuss the process parameters of WEDM. Mention its advantages and limitations.
- 13 a) Explain the principle and working of EBM process with a neat sketch.  
b) What do you understand by term LASER? How is a laser beam produced.
- 14 a) What do you understand by 'HERF'? Write the advantages and applications of HERF.  
b) Explain the principle and limitations of contact type of explosive forming process.
- 15 a) Explain the working principle and process variables of Water Hammer Forming.  
b) Differentiate clearly between backward spinning and forward spinning.
- 16 a) Discuss the limitations and characteristics of ECM.  
b) Explain ion etching process with a sketch. Write its applications.
- 17 Write short notes on the following:
  - a) Transducers used in USM
  - b) Tube spinning
  - c) Rubber pad forming

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**FACULTY OF ENGINEERING**  
**BE VI - Semester (AE) (CBCS) (Backlog) Examination, March / April 2021**

**Subject: Computer Aided Design Analysis & manufacturing**

**Time: 2 Hours**

**Max .Marks: 70**

**Note: Missing data, if any, may be suitably assumed**

**PART – A**

**Answer any five questions.**

**(5x2=10 Marks)**

- 1 Explain about CAD hardware and work station?
- 2 What is solid modelling?
- 3 Write down the features of an NC machine?
- 4 Explain mass property calculations?
- 5 Define a robot.
- 6 Write down the properties of splines.
- 7 Explain about translation.
- 8 What is CAD data base?
- 9 Define interpolation.
- 10 What is rapid prototyping?

**PART – B**

**Answer any four questions.**

**(4x15= 60 Marks)**

- 11 (a) Explain in detail about product life cycle?  
(b) Explain the differences for analytic and synthetic curves?
- 12 (a) Explain about planar, surface of revolution and tabulated cylinder with relevant sketches?  
(b) Give the differences between C-rep and B-rep.
- 13 (a) Write part program (APJ) for simple component.  
(b) Explain detail about tool length and cutter radius compensation?
- 14 (a) Explain about IGES format?  
(b) Write down the detailed steps involved in solving a FEA problem?
- 15 (a) What is CAPP? Explain about generative process planning?  
(b) Describe in detail about CMM?
- 16 (a) With a neat sketch explain scanning laser beam device?  
(b) Write down the differences between CNC and DNC.
- 17 (a) Write down the properties of B spline curves?  
(b) Write a note on reverse engineering.

**FACULTY OF ENGINEERING**  
**BE VI - Semester (CSE) (CBCS) (Backlog) Examination, March / April 2021**

**Subject: Web Programming**

**Time: 2 Hours**

**Max .Marks: 70**

**Note: Missing data, if any, may be suitably assumed**

**PART – A**

**Answer any five questions.**

**(5x2=10 Marks)**

- 1 What is list? Explain the different type of lists.
- 2 How to write comments in HTML? Explain with syntax and example.
- 3 Define an XML scheme. Show how an XML scheme can be created?
- 4 Distinguish between SAX and COM.
- 5 Explain the various control statements available with java script.
- 6 Write a simple java script program to greet a user based on time.
- 7 Explain deployment descriptor with an example.
- 8 How many JSP scripting elements are there? What are they?
- 9 How to declare a string in PHP? List various string functions in PHP.
- 10 What are the rules of PHP syntax?

**PART – B**

**Answer any four questions.**

**(4x15= 60 Marks)**

- 11 (a) Explain with help of an example the tables and forms in HTML.  
(b) Write a short notes on HTTP.
- 12 Explain how styling XML with CSS is done for the library information domain.
- 13 (a) Write a program in Java script to convert temperature from Celsius to Fahrenheit and vice versa or height from centimetres to inches and vice-versa.  
(b) Explain how to write functions in Java script.
- 14 How to use cookies and HTTP session for session tracking? Explain with an example program.
- 15 (a) Discuss various implicit objects in JSP.  
(b) Write a JSP program to validate username and password.
- 16 (a) Demonstrate file handling in PHP with an example.  
(b) Explain about database connectivity with PHP with suitable example.
- 17 Demonstrate the various types of drivers with diagrams. Write a sample code to retrieve data from a database table.

**FACULTY OF ENGINEERING**  
**BE VI - Semester (IT) (CBCS) (Backlog) Examination, March / April 2021**

**Subject: Compiler Construction**

**Time: 2 Hours**

**Max .Marks: 70**

**Note: Missing data, if any, may be suitably assumed**

**PART – A**

**Answer any five questions.**

**(5x2=10 Marks)**

- 1 List the operations on regular languages.
- 2 Write the structure of a lex program.
- 3 Write the rules for computation of Follow (B)
- 4 Compare SLR and LALR parser.
- 5 Define synthesized attribute, inherited attribute.
- 6 Define dependency graph.
- 7 What is nesting depth?
- 8 Define activation tree.
- 9 Define peephole optimization.
- 10 What is unreachable code?

**PART – B**

**Answer any four questions.**

**(4x15= 60 Marks)**

- 11 (a) Draw the transition diagram for unsigned numbers.  
(b) Explain porting process with a neat diagram.
- 12 Construct the predictive parser table for the following grammar.  
 $E \rightarrow TE'$ ,  $E' \rightarrow +TE'/\epsilon$ ,  $T \rightarrow FT'$ ,  $T' \rightarrow *FT'/\epsilon$ ,  $F \rightarrow (E) / id$
- 13 (a) Write the SDD for while control statement  
(b) List the any 5 common three address instruction forms.
- 14 (a) Explain the memory hierarchy of a computer with a neat diagram.  
(b) Explain the problems with manual deallocation request.
- 15 (a) Explain common sub expression elimination, dead code elimination  
(b) Explain eliminating redundant load and store, flow of control optimization.
- 16 Construct a CLR parser for  $S \rightarrow CC$ ,  $C \rightarrow a C \mid d$
- 17 Explain translation process with a neat diagram.