

FACULTY OF ENGINEERING**BE 4/4 (Civil) I – Semester (Backlog) Examination, October 2020****Subject: Structural Engineering Design and Detailing-II (steel)****Time: 2 hours****Max. Marks: 75****PART – A****Note: Answer any seven questions.****(7x5 =35 Marks)**

- 1 Sketch the horizontal truss bracings in deck type and through type plate girder bridges.
- 2 How is the self weight of truss girder determined?
- 3 Write the functions of end bearing in bridges.
- 4 Show the forces acting on the gantry girder by means of a sketch. What are their magnitudes for MOT and EOT cranes?
- 5 How is the economical span of a bridge determined?
- 6 When is the tension field method adopted? Elaborate the method.
- 7 Write about Horizontal truss effect on deck type bridges.
- 8 How are the dimensions of plate girder decided?
- 9 How the impact loads are handled in bridge design?
- 10 Explain the term “maximum static wheel load” as applied to crane Girders.

PART – B**Note: Answer any two questions.****(2x20 = 40 Marks)**

- 11 Design a welded plate girder without intermediate stiffeners and simply supported to carry a uniformly distributed live load of 75 KN/m and self weight of 10KN/m over an effective span of 20m. The compression flange of the girder is laterally supported. End bearing stiffeners need not be designed. Use Fe 410 grade steel and adopt LSM. Sketch the cross sectional details.
- 12 A welded plate girder is made of web 2000mmx10mm and flanges 560mmx50mm. The span of the girder is 24m and the load per meter length inclusive of its self weight is 105 KN/m. Design a suitable welded connection between the web and the flange. Also design bearing stiffeners and intermediate stiffeners. Use Fe410 grade steel and adopt LSM.
- 13 Design a simply supported gantry girder to carry vertical and horizontal loads for MOT crane, for the following data: Span of gantry girder=8m; Span of crane girder=18m; self weight of crane girder=200KN; self weight of trolley=50KN; Crane capacity=200KN; wheel base=3.5m; Minimum hook approach=1.2m; self weight of rails=300N/m. Adopt LSM and Fe410 grade steel.
- 14 The effective span of a plate girder through Type Bridge for a single broad gauge track is 30m. The dead load, live load and impact load reaction is 1200KN. The vertical reaction due to wind at each end of the girder is 80KN. The lateral load due to wind at each bearing is 34KN. Allowable stress in concrete is 7N/mm^2 . Design the rocker bearing. Sketch the details.

- 15 A deck type railway bridge has an effective span of 23m. It is subjected to broad gauge main line loading. EUDL for bending moment is 2204 KN/track and EUDL for shear force is 2420 KN/track. Design the girder for flexure, fix up the dimensions of girder and check for bending and shear stress. Draw neat sketches showing cross section and longitudinal section of the girder.
- 16 Design bottom chord member for a through type railway bridge of effective span 30m with 6 panels. Take EUDL for bending moment as 2727 KN/track and EUDL for shear force as 2997 KN/track. The truss is Pratt truss with a height of 6m. Draw neat sketch of member designed.

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FACULTY OF ENGINEERING**B. E. 4/4 (EEE) I – Semester (Backlog) Examination, October 2020****Subject: Power System Operation and Control****Time: 2 hours****Max. Marks: 75****PART – A****Note: Answer any seven questions.****(7x3 = 21 Marks)**

1. List the objectives of load flow studies.
2. How can a tap changing transformer be represented in load flow problem?
3. Write the coordination equation for economic generation scheduling of a system with three generators, accounting for the losses.
4. Discuss about droop of a generator.
5. Write the components of Area Control Error signal in two-area load frequency control.
6. What is swing curve? What is its utility?
7. How is voltage stability different from rotor angle stability?
8. What is the need of reactive power control in a power system?
9. What are the factors effecting the transient stability?
10. Give the functioning principle of TCSC with help of a circuit diagram.

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

11. (a) Give the basis of classification of various buses used for load flow studies.
- (b) Assuming flat voltage start, calculate the voltages at the PQ buses at the end of first iteration using Gauss Siedel Method for the following 4-bus system, whose Y_{BUS} is given.

Bus	Pi, pu	Qi, pu	Vi, pu	Remarks
1	-	-	1.04+j0.0	Slack bus
2	0.5	-0.2	-	PQ bus
3	-1.0	0.5	-	PQ bus
4	0.3	-0.1	-	PQ bus

$$Y_{BUS} =$$

-j21.7	j5.0	j6.7	j10.0
j5.0	-j21.7	j10.0	j6.7
j6.7	j10.0	-j16.7	j0.0
j10.0	j6.7	j0.0	-j16.7

12. (a) Explain how economic dispatch is implemented considering losses in the system.
 (b) Consider a two generator system described by the cost equations as:
 $F_1 = 0.024P_1^2 + 8P_1 + 80$ Rs/hr; $F_2 = 0.04P_2^2 + 6P_2 + 70$ Rs/hr. Use the lambda iteration method to find the economic dispatch for a total load demand of 250 MW.
13. Develop a model for two-area load frequency control.
14. (a) The A 50 Hz synchronous generator is connected to an infinite bus through a line. The pureactances of generator and the line are j0.3 pu and j0.2 pu. respectively. The generator no load voltage is 1.1pu. And that of the infinite bus is 1.0 pu. The inertia constant is 3.0 MW-sec/MVA. Determine the frequency of natural oscillations if the generator is loaded to 75% of its maximum power.
 (b) Explain the procedure for step by step solution of swing equation.
15. (a) Explain the functioning of Automatic Voltage Regulator with help of a neat sketch.
 (b) List the advantages of UPFC and STATCOM.
16. (a) Explain the stability of the system when there is a fault at terminals of a single machine connected to infinite bus, and the power is restored after the fault is cleared, by using Equal Area Criterion.
 (b) Compare various load flow methods.
17. Write short notes on:
 (a) Fast Decoupled Load flow method
 (b) Loss Coefficients.

FACULTY OF ENGINEERING**B.E.4/4 (Inst.) I-Semester (Backlog) Examination, October 2020****Subject : Analytical Instrumentation****Time: 2 hours****Max. Marks: 75****PART – A****Note: Answer any seven questions.****(7x3 = 21 Marks)**

- 1 Give the basic components of AI.
- 2 Explain the various regions of electromagnetic radiation.
- 3 Define spectrophotometer.
- 4 Write application of chromatography.
- 5 Explain NMR principle.
- 6 Define P^H .
- 7 What are the various detectors used in GC?
- 8 How CO in air is estimate using IR gas analyzers?
- 9 Define molar absorptivity.
- 10 Enlist at least four applications of mass spectrometer.

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

11. a) With the help of a mathematical equation, explain Beer Lambert's law.
b) What are the limitations of Beer Lambert's law?
12. a) With the help of diagram, explain magnetic wind instrument.
b) Explain Biosensors.
13. a) Explain in detail magnetic deflection mass spectrometer.
b) Discuss about sources of errors in spectrophotometer.
14. Explain electrodes used in P^H measurement.
15. Explain in detail gas chromatography with neat diagram.
16. a) Explain paramagnetic oxygen analyser.
b) Explain in detail Thermal conductivity meter.
17. Write a short note on
 - a) Polar graph.
 - b) NMR.

FACULTY OF ENGINEERING**B.E 4/4 (ECE) I-Semester, (Backlog) Examination, October 2020****Subject: MICROWAVE ENGINEERING****Time: 2 hours****Max. Marks: 75****PART – A****Note: Answer any seven questions.****(7x3 = 21 Marks)**

- 1 Sketch E & H field distributions of TE in parallel plane waveguide.
- 2 Differentiate between Dominant and Degenerate modes.
- 3 Define Faradays Law of Rotation.
- 4 Mention any four applications of Magic-Tee
- 5 List the high frequency limitations of conventional tubes.
- 6 What is Mode- Jumping in a Magnetron and Define π -mode.
- 7 Give the relations of Static & Dynamic Figure of Merit of a Varactor Diode.
- 8 An IMPATT diode has a drift length of 2 μm . Determine
 - i) Drift time of the carrier
 - ii) Operating frequency of the diode.
- 9 Define Inter-Valley transfer or Population Inversion in a GUNN diode.
- 10 Distinguish between O-Type and M-type magnetrons.

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

- 11 Give the characteristics of TE & TM propagation modes for parallel plane waveguides
- 12 a) Prove that the attenuation of a wave guide is
 $\alpha = \text{power lost in the guide per unit length} / 2 * \text{power injected}$
 b) Derive the expressions for Q-factor of a Waveguide.
- 13 a) Derive the Scattering matrix of a directional coupler.
 b) Why are phase shifters and attenuators needed in a microwave network?
- 14 With the help of Applegate diagram explain the principle and operation of a two cavity klystron amplifier.
- 15 a) Explain construction , operation and applications of a varactor diode.
 b) Why are slow wave structures used in TWT & mention its characteristics.
- 16 a) Derive the expressions for attenuation and Q-factor of rectangular waveguides
 b) Two Identical directional couplers are used in a waveguide to sample the incident and reflected powers. The output of the two couplers is found to be 2.5mW and 0.15mW. Find the value of VSWR in the waveguide.
- 17 a) Explain the construction and principle of operation of a PIN Diode.
 b) Derive the expressions for hull cut-off magnetic field.

FACULTY OF ENGINEERING
BE 4/4 (I.T.) I-Semester (New)(Backlog) Examination, October 2020

Subject: Middleware Technologies

Time: 2 hours

Max. Marks: 75

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

- 1 Differentiate between generic and service specific Middleware.
- 2 Write short notes on Servlets.
- 3 What are the features of EJB?
- 4 What is entity EJB?
- 5 What is the need for EAI?
- 6 What is the difference between RMI and CORBA?
- 7 Briefly explain about the use of IL code in .NET.
- 8 What is assembly in .NET framework?
- 9 What does Django mean?
- 10 What advantages does python bring for the Django framework?

PART – B

Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 (a) Explain about the different types of servers.
(b) Explain the lifecycle of a servlet.
- 12 (a) Explain the usage of annotations in EJB-3.
(b) Explain the usage of session EJB.
- 13 (a) What are SAIM principles?
(b) Explain CORBA architecture.
- 14 Explain .NET architecture.
- 15 How is Django useful as server side web framework?
- 16 Explain different JDBC driver types.
- 17 Write short notes on the following :
 - (a) CGI
 - (b) ORB

FACULTY OF ENGINEERING
BE 4/4 (IT) I-Semester (Old) Examination, October 2020

Subject: Middleware Technologies

Time: 2 hours

Max. Marks: 75

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

- 1 Define the term "Middleware".
- 2 Compare Client/Server and Peer-to-Peer models.
- 3 What is a Web Application Development Framework?
- 4 Discuss briefly getSession() and getSession(Boolean) methods of HttpSession.
- 5 List the services of EJB container.
- 6 Explain briefly the life cycle of Stateless Session Bean.
- 7 What is an Interface Definition Language?
- 8 Differentiate between Web Services, CORBA and DCOM?
- 9 Differentiate between .NET Web Services and .NET Remoting?
- 10 What is IUnknown interface?

PART – B

Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 a) Explain How RPC works with examples.
b) Discuss the advantages and disadvantages of Client / Server model.
- 12 Describe the struts framework in detail.
- 13 a) Explain EJB Ecosystem. What are its applications?
b) Explain the Life cycle of Entity Beans.
- 14 Explain the CORBA Architecture in detail with the help of object model.
- 15 a) Compare and contrast COM and CORBA.
b) Explain the architecture of .NET framework.
- 16 Demonstrate how cookies can be used to handle a Session in Servlets.
- 17 a) List and explain any five CORBA alternatives.
b) Explain the SOAP and WSDL.

FACULTY OF ENGINEERING

B. E. (Civil) VII – Semester (CBCS) (Suppl.) Examination, October 2020

Subject: Structural Engineering Design and Detailing II (Steel)

Time: 2 hours

Max. Marks: 70

PART – A

(7x4 = 28 Marks)

Note: Answer any seven questions.

1. Explain the terms web buckling and web crippling.
2. How do you estimate the self weight of a plate girder?
3. What are the functions of end bearing stiffeners in plate girders?
4. List out the forces acting on a gantry girder.
5. Draw neat sketches of rocker and roller bearings.
6. How do you calculate maximum shear force in the design of gantry girder?
7. For a railway bridge with single track main line loading, what is the allowable impact factor?
8. Explain flange splicing of plate girder.
9. Explain why compression flange of a gantry girder is strengthened.
10. Draw typical cross section of a through type plate Girder Bridge.

PART – B

(2x21 =42 Marks)

Note: Answer any two questions.

11. Design a simply supported welded plate girder 28m in span and laterally restrained throughout. It carries a factored EDL of 60 KN/m through out the span exclusive of self weight. Design the cross section and end bearing stiffeners carrying out any 2 checks. Use Fe410(E250) steel: Use limit state design.
12. Design a welded plate girder of 20 m span following factored forces. Bending Moment = 4000 KN-m. Shear Force = 1100KN. Dimensions of web are 1600mm x 12 mm and flanges are 440mm x 32 mm thick. Design intermediate stiffness and end bearing stiffeners. Adopt Fe 410 steel and use limit state method.
13. Design the cross section of a gantry girder for maximum BM for the following data:
Span of gantry girder = 10m
Crane capacity = 150KN
Weight of crab = 60 KN
Total weight of crane girder = 100 KN
Span pf crane girders = 16 m
Minimum approach of hook to the gantry gravity = 1m
Wheel base = 2m.

14. Design a rocker bearing for a bridge for following data:

Total gravity load including impact = 720 KN

Vertical load due to wind = 80 KN

Lateral load due to wind = 60 KN

Longitudinal force = 200 KN

Compressive strength of concrete = 7 N/mm².

15. Design a deck type plate girder for a railway bridge for broad gauge main line loading of EUDL of 1800 KN/track for BM and SF. Effective span of girder is 22m. Design the cross section connections. Curtail the flange plates. Draw neat sketch of cross section of the girder.

16. Design one top chord and one bottom chord of a pratt truss having 5 panels of 5m each. Height of truss is 7.5m. The truss is subjected to EUDL of 2000 KN pr track.

FACULTY OF ENGINEERING

B.E. VII-Semester (CBCS) (EEE) (Suppl.) Examination, October 2020

Subject : Power System Operation and Control

Time: 2 hours

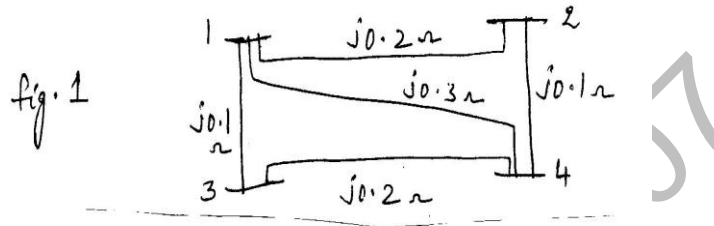
Max. Marks: 70

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

1. List out the assumptions made in FDLF method.
2. For the system show in figure 1 find Y-Bus?



3. The incremental fuel costs in Rs/MWh of two generating plants are given as

$$\frac{dF_1}{dP_1} = 0.008P_1 + 8; \quad \frac{dF_2}{dP_2} = 0.012P_2 + 9$$

4. The system is operating on economic dispatch with $P_1 = P_2 = 500$ MW and

$$\frac{\partial P_L}{\partial P_2} = 0.2. \text{ Find the penalty factor of plant 2}$$

5. List out the advantages of pool operation.
6. Two turbo alternators rated for 120 MW and 210 MW have governor droop characteristics of 5% from no load to full load. They are connected in parallel to share a load of 250 MW. Determine the load shared by each machine assuming free governor action.
7. Define steady state stability limit of a power system network.
8. A 50 Hz, 4 pole turbo generator rated 100 MVA, 11kV has an inertia constant of 80MJ/MVA. If the mechanical input is suddenly raised to 80 MW for an electrical load of 50 MW, find rotor acceleration. Neglect losses.
9. Establish the relationship between incremental changes of Q, P and V in a node.
10. What is reactive power compensation?

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

11. For the system of figure 1. Find the voltages at the receiving end bus at the end of the first iteration. Load is $2 + j0.8$ pu voltage at the sending end (slack) bus is $1 + j0.0$ pu. Line admittance is $1.0 - j4.0$ pu. Transformer reactance is $j0.4$ pu. Off nominal turns ratio is $1/1.04$. Use Gauss seidel method. Assume $V_R = 1 + j0$.



12. The losses in the lines shown in Figure 2 are proportional to the square of the powerflow. Both units are loaded at 250 MW. Due to transmission loss 12.5MW of power is lost. Where should the extra 12.5 MW be generated for economic operation? Attempt are scheduling to minimize the transmission loss.

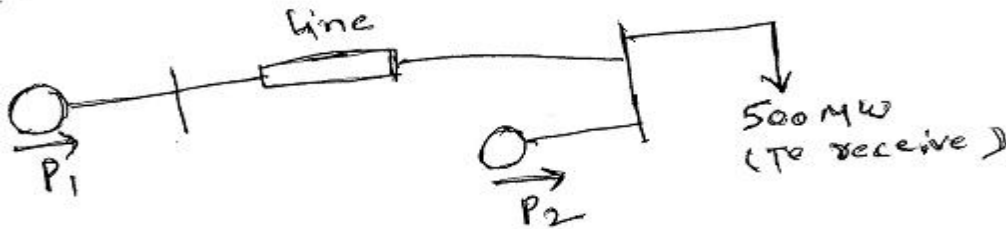


Figure 2

Give that line loss = $.0002 p_2^2$, w;

$F_1(p_1) = F_2(p_2) = 400 + 7p + .002p^2$ and

$P_1 = \text{max } 400\text{MW and min } 70\text{MW}$

$P_2 = \text{max } 400\text{MW and min } 70\text{MW}$

13. From fundamentals obtain the block diagram representation of a single area-controlled power system network.
14. (a) Derive the swing equation for a single machine connected to infinite bus system. State the assumptions if any and state the usefulness of this equation. Neglect the damping.
(b) Describe the equal area criterion for transient stability analysis of a system.
15. (a) What is the importance of V-I characteristics of STATCOM?
(b) What are the conclusions made from the TCSC modes of operation?
16. (a) Give the advantages and disadvantages of Gauss-Seidel method and Newton-Raphson method of load flow analysis.
(b) Write the equations to calculate Slack bus power, Transmission losses and Line flows.
17. (a) Explain bus incidence matrix.
(b) How the SVC prevents the reactive power rating, reaching its limit too frequently
(c) Write the most important mode of operation of power system and mention the major problems encountered with it.

FACULTY OF ENGINEERING

B.E. (Inst.) VII-Semester (CBCS) (Suppl.) Examination, October 2020

Subject: Opto-Electronic Instrumentation

Time: 2 hours

Max. Marks: 70

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

1. Mention classification of LASERS?
2. Give the characteristics of Laser stabilization.
3. Explain about beam modulation Telemetry.
4. Mention different application of LASERS in Engineering.
5. What are the advantages of step index fibres and graded index fibres?
6. What is fundamental transmission theory?
7. Give classification of fibre optic sensors.
8. Classify optical fibre.
9. Mention the special features of LCD.
10. Calculate the efficiency of a PIN diode if the responsivity is 0.58A/W at 800nm.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

11. a) With energy level diagrams explain solid lasers.
b) Explain with suitable diagram the working & Construction features of Argon lasers.
12. a) With its constructional diagram explain different modes of operation of Laser Strain gauges.
b) Explain with neat diagram LASER machining.
13. a) Explain Holographic Technique of reconstructing a 2-D image.
b) What is procedure of fibre fabrication and manufacturing? Explain any one fabrication technique in detail with suitable diagram.
14. a) With necessary diagram explain how fibre optic sensors are classified.
b) Explain how pressure is measured using optical fibres.
15. a) Describe the working and operation of Opto isolators. How they are useful in an electrical circuit?
b) Write short notes on solar cells and mention the applications.
16. a) Explain measurement of voltage and fluid level optical fibres.
b) What are safety precaution in LASERS?
17. Write short notes on the following:
 - a) LED
 - b) Photo transistor

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FACULTY OF ENGINEERING

BE VII Semester (CBCS) (ECE) (Suppl.) Examination, October 2020

Subject: Embedded System

Time: 2 hours

Max. Marks: 70

PART – A

Note: Answer any five questions.**(5x2 = 10 Marks)**

1. Draw a neat diagram of an embedded system.
2. List various application areas of embedded systems and give examples.
3. Write any 4 features of CISC and RISC Architectures.
4. Brief the significance of Link register and CPSR register in ARM register organization.
5. How does CAN differ from I2C?
6. What is FireWire? What is the main purpose of FireWire?
7. Differentiate between host and target machine.
8. What does a linker do?
9. Give a brief note on ROM emulators.
10. Mention the advantage of Logic Analyzer.

PART – B

Note: Answer any four questions.**(4x15 = 60 Marks)**

11. a) Define Embedded System. What are the classifications of Embedded Systems?
b) Explain the characteristics and the design metrics of an embedded system.
12. a) With a block diagram explain ARM core architecture and explain how the barrel shifter is being utilized in the pipelining process of ARM.
b) What is Thumb mode? Explain its importance.
13. Explain in detail about USB protocol working principle, frame formats with advantages and disadvantages of it.
14. a) What are the various developmental phases in the design of embedded system.
b) What is PROM programmer?
15. a) What are the different techniques and tools used to test the embedded hardware and embedded software.
b) Briefly explain about in circuit emulator (ICE)
16. a) Explain about the design process in embedded system.
b) Describe the AMBA bus with a neat sketch.
17. Write notes on any two:
 - a) Embedded System-on-chip (SOC)
 - b) PCI, PCI-X Protocols
 - c) IDE and Simulator

FACULTY OF ENGINEERING
B.E. (Mech.) VII-Semester (CBCS) (Suppl.) Examination, October 2020

Subject : Thermal Turbo Machines

Time: 2 hours

Max. Marks: 70

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 Derive area ratio as function of mach number and pressure for a convergent-divergent nozzle.
- 2 Write relation for stagnation pressure and stagnation temperature in terms of mach number.
- 3 Express sound velocity in terms of bulk modulus.
- 4 Explain surge and stall in compressor.
- 5 Draw velocity diagram on common base of peripheral velocity of blade for steam turbine and identify all velocities and angles on the triangle.
- 6 Define degree of reaction of compressor and turbine.
- 7 Define nozzle efficiency, blading efficiency and stage efficiency of steam turbines.
- 8 Draw the configuration diagram and temperature entropy diagram for open cycle gas turbine.
- 9 List the various methods to improve the performance of gas turbine.
- 10 What is the difference between solid propellant rocket and liquid propellant rocket?

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 A conical diffuser has entry and exit diameters of 15cm and 30cm respectively. The pressure temperature and velocity of air at entry are 0.69bars, 340K and 180m/s respectively. Determine i) pressure and velocity at exit ii) stagnation pressure, stagnation temperature and stagnation density iii) Force exerted on diffuser walls.
- 12 A gas at $p_1= 1.0$ bar, $T_1=400$ K enters a 30cm dia pipe at a Mach no of 2.0. A normal shock occurs at a Mach no of 1.5 and exit Mach no is 1.0 .If the mean value of friction is 0.003 determine i) Length of duct upstream and downstream of the shock wave ii) mass flow rate of gas. iii) Pressure and temperature at exit condition
- 13 A single eye, single stage centrifugal compressor delivers 15kg of air per second with a pressure ratio of 4 when running at 15000rpm. The pressure and temperature of the air at the suction side are 1.0 bar and 17^oc assume slip factor = 0.9 work input factor = 1.08 ,isentropic efficiency = 85% Find i) the input power required to drive the compressor ii) blade angle at the impeller eye if the tip diameter is twice the root diameter.
- 14 The discharge blade angles for both stator and rotor of an axial steam turbine are 20^o w.r.t tangential direction of flow .Absolute velocity of steam at the exit of fixed blade is 140m/s .Ratio of flow velocity to blade speed is 0.7 and 0.76 at entry and exit of rotor blades respectively. Calculate the power developed by the turbine blade for a steam flow rate of 2.6kg/s .Find also the inlet blade angle and degree of reaction.

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- 15 In a parson reaction turbine, the blade inlet angle and blade outlet angle are 35° and 20° respectively .The blade speed is 100m/s .Calculate the tangential force , power developed , diagram efficiency and axial thrust of the turbine ,if the steam consumption is 1kg/min.
- 16 Air enters at 1bar and 27°C into the compressor of constant pressure gas turbine plant and leaves the compressor at 6,2barThe fuel has CV of 44186kj/kg and fuel air ratio is 0.017 Isentropic efficiency of compressor and turbine are 88% and 90%. Take $\gamma=1.4$ and c_p for air =1.005 $\gamma=1.3$ and $c_p= 1.147$ for products of combustion 1) Estimate qty of air circulation in the system if plant develops 1200kW 2) Heat supplied per kg of air circulation and 3) net work done 4) thermal efficiency of cycle
- 17 (a) Define thrust power, propulsive power, propulsive and overall efficiency of jet engine.
(b) A turbo jet engine flying at a speed of 960km/h consumes air at the rate of 54.5kg/s .calculate
(i) Exit velocity of jet when enthalpy change for nozzle is 200kj/kg and velocity coefficient is 0.97
(ii) Fuel flow rate in kg/s when the air fuel ratio is 75:1
(iii) Thrust specific fuel consumption.

FACULTY OF ENGINEERING

BE VII (Prod.) Semester (CBCS) (Suppl.) Examination, October 2020

Subject: Tool Design

Time: 2 hours

Max. Marks: 70

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 State the favorable conditions for formation of built up edge?
- 2 What are the different types of tool failure?
- 3 How is tool chip interface temperature evaluated?
- 4 Explain Tool design objective?
- 5 Discuss the desirable properties of a tool material?
- 6 Why is Cubic Boron Nitride better than Diamond for machining steel?
- 7 What is meant by optimum die clearance?
- 8 What is center of pressure?
- 9 Differentiate between Pull and Push type broaches?
- 10 Define the term redundant location?

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 (a) Give a brief classification of metal cutting operations?
(b) What is the mechanism of chip formation?
- 12 (a) What is meant by Tool signature? Explain Tool nomenclature in Orthogonal Rake System?
(b) Explain Economics of Tooling?
13. (a) What is meant by Tool life? How Tool life is evaluated?
(b) Explain about the factors that affect machinability?
14. (a) What is cutting fluid? State its main functions?
(b) Compare the properties and applications of Cemented carbides and Ceramic cutting tool materials?
15. (a) What are the essential elements of a press tool? Label them on neat sketch?
(b) Write short notes on Bending dies and Forging dies?
16. (a) Explain with neat sketches, the various clamping devices?
(b) Define Jig and Fixture? How are Jigs and Fixtures classified?
17. (a) Draw neat sketch of standard twist drill and indicate its various elements?
(b) State design considerations of milling cutter?

FACULTY OF ENGINEERING**B. E. (CSE) (CBCS) VII – Semester (Suppl.) Examination, October 2020****Subject: Compiler Construction****Time: 2 hours****Max. Marks: 70****PART – A****Note: Answer any five questions.****(5x2 = 10 Marks)**

1. Specify the functionality of linker, loader, and compiler.
2. What is Regular Expression?
3. What do you mean by left factoring the grammars?
4. Calculate the first and follow for the following grammar: -

 $S \rightarrow x ABC$ $A \rightarrow a|bbD$ $B \rightarrow a|\epsilon$ $C \rightarrow b|\epsilon$ $D \rightarrow c|\epsilon$

5. Why SLR and LALR are more economical than Canonical LR Parser?
6. What are the goals of error handler?
7. Explain how dynamic allocation is done.
8. Define an attribute. Give the types of an attribute.
9. What do you mean by machine dependent and machine independent optimization?
10. Define peephole optimization.

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

11. (a) What are the various phases of compiler? Explain each phase in detail. Illustrate the output of each phase of the compilation for the input

 $Pos = initial + rate * 60$

- (b) What is LEX?

12. (a) Apply the rules for left factoring in the following grammar:

 $A \rightarrow aAB | aA | a$ $B \rightarrow bB | b$

- (b) Is the given grammar LL(1)?

 $E \rightarrow E + T | T$ $T \rightarrow T * F | F$ $F \rightarrow (E) | id$

13. (a) Construct an SLR parsing table for the grammar, Is it SLR(1) grammar?

 $A \rightarrow aAa | bAb | ba$

(b) Construct an LALR (1) parsing table for the following given grammar

$S \rightarrow Ba \mid bBc \mid dc \mid bda$

$B \rightarrow d$

14. With a neat diagram explain the format of the Symbol Table. And discuss the tree structures representation of scope information.

15. (a) Explain various machine independent code optimization techniques.

(b) Generate the three-address code for the following cod fragment.

While ($a > b$)

{

If($c < d$)

$X = y + z;$

Else

$X = y - z;$

}

16. (a) Discuss YACC.

(b) Explain DAG representation of the basic blocks with an example.

17. Write short notes on: ANY TWO

(a) Design issues of Code Generator.

(b) Garbage collection.

(c) Syntax Directed Translation.

FACULTY OF ENGINEERING

B. E. (IT) (CBCS) VII – Semester (Suppl.) Examination, October 2020

Subject: VLSI Design

Time: 2 hours

Max. Marks: 70

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

1. Define Moore's law.
2. Construct XOR and XNOR gate using CMOS.
3. Draw the logic diagram and layout of transmission gate.
4. Write about Design rules.
5. What is latch up?
6. Write in brief about Domino logic.
7. Write about the Pseudo nMos logic and draw Pseudo nMos NAND gate.
8. Define rise time and full time delay.
9. Write about blocking & non blocking assignment.
10. Write in brief about testing.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

11. (a) What are the different layers present in MOSFET ? Explain.
(b) Derive nFET current equation in non saturation region.
12. (a) Draw the stick diagram of two input NAND gate.
(b) Write about photolithography process.
13. (a) Draw and explain the Inverter Switching characteristics.
(b) Draw the layout of the following basic structures: (a) n+ region (b) p+ region
(c) Active contact.
14. (a) Explain the operating modes of 6T SRAM.
(b) Draw the CVSL of NAND / AND.
15. (a) Write about the carry, look ahead adder.
(b) Write the verilog code for priority encoder.
16. (a) Write about floor planning.
(b) Write about various routing technique.
17. (a) Write about various modeling technique.
(b) Draw and explain VLSI Design hierarchy.
