

B. Tech Degree VIII Semester Examination April 2011

CS/EC/EE/EI 804 (A) DIGITAL IMAGE PROCESSING
(2006 Scheme)

Time : 3 Hours

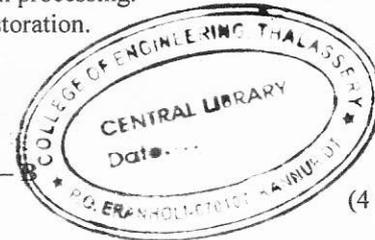
Maximum Marks : 100

PART – A
(Answer ALL questions)

(8 x 5 = 40)

- I. (a) Write short note on Haar Transform.
 (b) Obtain the equations for the transformations that
 (i) sketches gray scale range (0,10) into (0,15)
 (ii) shifts range (10,20) to (15,25)
 (c) Explain the use of motion in segmentation.
 (d) What is histogram? Write short note on histogram processing.
 (e) Explain the inverse filtering method for image restoration.
 (f) Explain intensity slicing.
 (g) Explain various types of redundancies in images.
 (h) Explain the fundamentals of fractals.

PART –



(4 x 15 = 60)

- II. (a) Define DFT. Explain how this can be used for image compression. (8)
 (b) Explain the quantization mechanism of images. (7)

OR

- III. (a) Write short note on wavelet transform and its application. (8)
 (b) Explain perspective transformations. (7)

- IV. What is meant by image enhancing? Explain various methods for the same in spatial and in frequency domain. (15)

OR

- V. Explain the significance of Hough Transform. List its advantages over other Transforms. (15)

- VI. Explain the following color models : (15)
 (i) RGB
 (ii) CMY
 (iii) YIQ
 (iv) HIS

OR

- VII. (a) Explain the significance of circulant and block circulant matrices. (8)
 (b) Explain the principle of pseudo color image processing. (7)

- VIII. (a) Decode the arithmetic coded message, 0.23355 for the coding model.

Symbol	Probability
a	0.2
e	0.3
i	0.1
o	0.2
u	0.1
!	0.1

(8)

- (b) Explain the basics of transform coding. (7)

OR

- IX. Explain the JPEG method for image compression. (15)

B. Tech Degree VIII Semester Examination April 2011

CS 801 SECURITY IN COMPUTING
(2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART – A
(Answer ALL questions)

(8 x 5 = 40)

- I. (a) Briefly explain the types of attack on computer and network systems.
(b) Explain how modular arithmetic can be used in cryptography. Give example.
(c) Explain with an example any Symmetric key encryption algorithm.
(d) Compare and contrast DES with Double DES (any two features).
(e) Explain public key encryption and its uses.
(f) With a suitable example explain primality testing.
(g) Explain how public key encryption can be used to create digital signatures. Give example.
(h) Briefly explain malicious software.

PART – B

(4 x 15 = 60)

- II. Explain the substitution cipher systems and transposition cipher systems with suitable examples. (15)

OR

- III. (a) Comment on Modular Arithmetic and its properties. (7)
(b) Explain Quadratic residues with suitable examples. (5)
(c) What is Fermat's Theorem? (3)

- IV. Explain in detail DES Algorithm. (15)

OR

- V. Explain in detail AES Algorithm. (15)

- VI. With a suitable example explain Miller-Rabin Algorithm. (15)

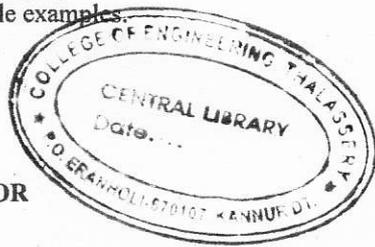
OR

- VII. Explain Diffie-Hellman Cryptosystem and its uses. (15)

- VIII. Write short notes on :
(i) SSL
(ii) IP Security
(iii) FDS (15)

OR

- IX. (a) Explain any two types of firewalls and their design. (12)
(b) What is a secure-email? (3)



B.Tech Degree VIII Semester Examination April 2011

CS 802 ARTIFICIAL INTELLIGENCE (2006 Scheme)

Time : 3 Hours

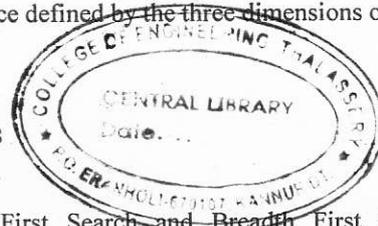
Maximum Marks : 100

PART - A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Write a short note on the components of a Production System.
(b) Write a note on features of partially commutative production system.
(c) Describe the concept of Unification Algorithm.
(d) What is meant by 'Skolemization'?
(e) What are the main differences between scripts and frame structures?
(f) Represent the following sentence as conceptual dependency structure. "Sam gave Mary a box of candy".
(g) Describe the software agents in terms of a space defined by the three dimensions of *agency, intelligence* and *mobility*.
(h) Write a short note on agent topology.

PART - B



(4 x 15 = 60)

- II. (a) Compare the advantages of Depth First Search and Breadth First Search techniques. (7)
(b) Explain various issues in the design of search programs. (8)
- OR**
- III. (a) Compare the performance of A* and AO* Algorithm with the help of an example. (10)
(b) Describe the procedure for Constraint Satisfaction with the help of an example. (5)
- IV. (a) Translate the sentence "Anything anyone eats and isn't killed by is food" into Conjunctive Normal Form (CNF). (10)
(b) Write a short note on Goal Trees. (5)
- OR**
- V. The following facts are given :
(i) Everyone who loves all animal is loved by someone
(ii) Anyone who kills an animal is loved by no one
(iii) Jack loves all animals
(iv) Either Jack or Curiosity killed the cat, who is named Tuna
Use resolution technique to answer the question.
Did curiosity kill the cat? (15)
- VI. (a) Describe the Logics for Nonmonotonic reasoning. (10)
(b) Differentiate between procedural knowledge and declarative knowledge. (5)
- OR**
- VII. (a) Explain various steps involved in Natural Language Understanding process. (6)
(b) Write a short note on :
(i) Transformational grammar
(ii) Case grammar
(iii) Semantic grammar (9)
- VIII. Describe the usages of software agents. Also explain the characteristics of software agents. (15)
- OR**
- IX. Explain the implementation of Intelligent agents in Java. (15)

B. Tech Degree VIII Semester Examination April 2011

CS 803 OBJECT ORIENTED MODELING AND DESIGN (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART – A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Briefly explain Object Oriented Design principles.
(b) With suitable example explain object relationships.
(c) Distinguish static model with dynamic model. Give example.
(d) Describe the basic activities in object oriented analysis.
(e) With suitable example explain a use case diagram.
(f) Comment on Events and Signals. Give examples.
(g) Explain the structure of UP.
(h) Explain the usage of Design frameworks.

PART – B

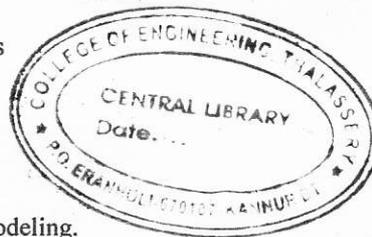
(4 x 15 = 60)

- II. (a) With suitable example explain Dynamic model and Functional model in Object Oriented Modelling. (10)
(b) Explain an event trace diagram. (5)
- OR**
- III. (a) Explain any one Object Oriented design method. (10)
(b) What is object refinement? (5)

- IV. With suitable example explain an object diagram and a class diagram. (15)

OR

- V. Write short notes on :
- (i) Template classes
 - (ii) Realization
 - (iii) Packages



(3 x 5 = 15)

- VI. (a) Describe UML Behavioral Modeling. (12)
(b) What are activity semantics? (3)

OR

- VII. (a) Distinguish Activity Diagram with State chart diagram. (12)
(b) Explain state machines. (3)

- VIII. (a) With suitable example explain collaboration diagram and component diagram. (10)
(b) What is a deployment diagram? Give example. (5)

OR

- IX. (a) Briefly explain Design Patterns. (6)
(b) Describe architecture description language. Give example. (9)

B. Tech Degree VIII Semester Examination April 2011

CS/IT 804 (D) MOBILE COMPUTING (2006 Scheme)

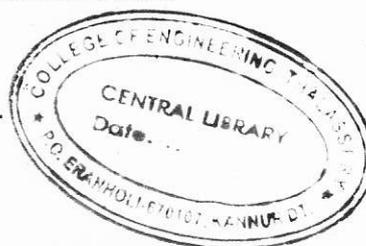
Time : 3 Hours

Maximum Marks : 100

PART – A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) What is meant by voice oriented data communication?
(b) Describe any two mobile devices.
(c) What is QoS?
(d) What are the transaction Models?
(e) Give a short description about EDGE.
(f) What you mean by OFDM?
(g) Describe about MANET.
(h) Give a short description about VPN.



PART – B

(4 x 15 = 60)

- II. Explain mobile computing architecture. (15)
- OR**
- III. What are the main features of Mobile OS? Explain any two mobile OS. (15)
- IV. (a) Describe slow start of congestion control. (5)
(b) Explain snooping TCP. Give the advantages and disadvantages of STCP. (10)
- OR**
- V. Discuss about the various cache invalidation mechanisms. (15)
- VI. Explain GPRS system architecture and protocol layers. (15)
- OR**
- VII. Briefly explain about the Generation of cellular network. (15)
- VIII. Briefly explain about wireless LAN Security. (15)
- OR**
- IX. Write short notes on –
(i) XML
(ii) UML
(iii) J2ME

(3 x 5 = 15)

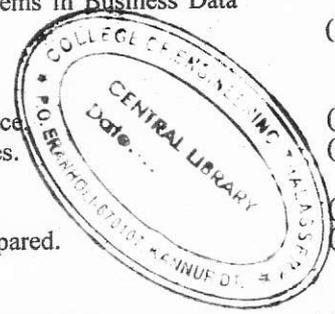
B.Tech Degree VIII Semester Examination April 2011

CS 804 (C) SOFTWARE ARCHITECTURE (2002 Scheme)

Time : 3 Hours

Maximum Marks : 100

- I. (a) Explain with suitable examples pipes and filters. (10)
(b) Explain in detail process – control paradigms. (10)
OR
- II. (a) Explain the architectural styles, layered systems and repositories with suitable examples. (10)
(b) Explain heterogeneous architectures. Give suitable examples. (10)
- III. (a) Explain integration in Software development Environments. (10)
(b) Explain the layered architecture of Multi database system. (10)
OR
- IV. (a) Explain the architectural structures for shared information systems. (10)
(b) Write a note on the evolution of shared information systems in Business Data Processing. (10)
- V. (a) Explain the functional dimensions considered in design space. (10)
(b) Explain the design guidance for User Interface Architectures. (10)
OR
- VI. (a) Explain the rules for designing a user interface. (10)
(b) With a suitable example explain, how a design space is prepared. (10)
- VII. (a) Briefly explain the various approaches used for formalizing software architecture. (12)
(b) Write short note on first class connectors. (8)
OR
- VIII. Explain in detail the various steps involved in formalizing the architecture of a specific system. (20)
- IX. (a) Briefly explain the features of anyone universal language. (10)
(b) Explain any two architectural styles. Give examples. (10)
OR
- X. Write short notes on :
(i) Architectural Interconnection (8)
(ii) Aesop (6)
(iii) Software Architects Education. (6)



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IT 801 ELECTRONIC BUSINESS AND SERVICES (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART – A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Compare E-Business and E-Commerce.
(b) E-Commerce is enabling companies to listen to their customers and become their "the cheapest", the most "familiar" or "the best". – What does it mean?
(c) What are the principles of Operational Excellence?
(d) Write a short note on five stage of e-business design.
(e) What are the goals of selling chain management?
(f) What is the significance of ERP in a company?
(g) What do you mean by distribution and reverse distribution in supply chain management?
(h) Write a short note on Operating Resources.

PART – B

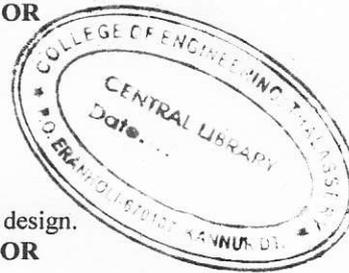
(4 x 15 = 60)

- II. Explain the eight rules of E-Business.

OR

- III. Explain :

- (i) Service/process trends
(ii) Organizational trends



- IV. Explain different steps in E-Business design.

OR

- V. What is CRM? Explain :

- (i) Goal of CRM
(ii) Phases of CRM
(iii) Challenges in implementing CRM

- VI. What are the business forces driving the need for selling chain management?

OR

- VII. Write notes on

- (i) SAP
(ii) COTS ERP
(iii) ASAP
(iv) Glovia

- VIII. What is Supply Chain Management? What are the elements of Supply Chain Planning of Execution.

OR

- IX. What is e-procurement? Explain in detail.

B. Tech Degree VIII Semester Examination April 2011

IT 802 REAL TIME SYSTEMS

(2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART A

(Answer ALL questions)

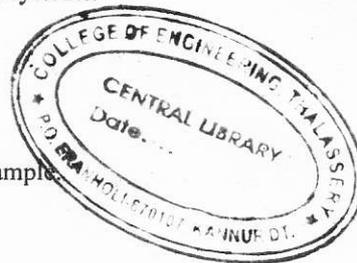
(8 x 5 =40)

- I. (a) What is real time? Explain any two applications of a real time system.
(b) Explain the different multiprocessor task allocation algorithms.
(c) What is PIP? Explain in detail.
(d) Explain POSIX.
(e) Briefly explain the protocol used for the reservation of resources.
(f) Explain the various types of service disciplines by giving an example for each.
(g) What is temporal data? Briefly explain the characteristics of temporal data.
(h) Explain any two applications of a real time data base.

PART B

(4 x 15 = 60)

- II. (a) Explain the classification of timing constraints with a suitable example. (9)
(b) Explain about clock synchronization. (6)
- OR**
- III. (a) Briefly explain about the classification of Real Time Scheduling algorithms. (3)
(b) Explain about clock driven and even driven scheduling algorithm with suitable example. (12)
- IV. (a) Explain HLP in detail. (5)
(b) Explain about different bench mailing techniques done in Real Time Systems. (10)
- OR**
- V. (a) Briefly explain PCP and PIP. (10)
(b) Explain any three features of Real Time Operating Systems. (5)
- VI. (a) Explain about bounded access protocols. (9)
(b) Explain the various QoS parameters in RTS. (6)
- OR**
- VII. (a) What is rate control? Explain in detail with an example. (5)
(b) Describe the different LAN architectures. (7)
(c) Explain the differentiated QoS service model. (3)
- VIII. (a) Explain the various pessimistic concurrency control protocols. (10)
(b) Give the differences between traditional databases and real time databases. (5)
- OR**
- IX. (a) Explain Optimistic Concurrency Control Protocols in detail. (10)
(b) Give a short note on Speculative Concurrency Control Protocols. (5)



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IT 803 SOFTWARE PROJECT MANAGEMENT (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART – A (Answer ALL questions)

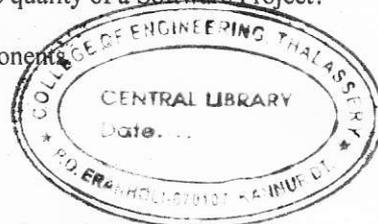
(8 x 5 = 40)

- I. (a) Write a note on Prototyping.
(b) What is meant by Resource Allocation and Scheduling?
(c) Write a note on Quality Review and characteristics.
(d) Describe about planning guidelines.
(e) Write a note on formal technical review.
(f) Write the necessity of SCM in Software Industry.
(g) Explain any three project team structures.
(h) Write a note on Productivity Attributes.

PART – B

(4 x 15 = 60)

- II. (a) Differentiate between the Activity Break Down and the Activity Networks. (7)
(b) Write a note on COCOMO model function point analysis. (8)
- OR**
- III. (a) Describe various Project Planning Techniques. (8)
(b) Describe various approaches to sizing and estimating. (7)
- IV. What are the various steps involved in assuring the quality of a Software Project? (15)
- OR**
- V. Explain in detail about the structure of Plan Component. (15)
- VI. (a) Describe the activities of SCM in detail. (8)
(b) What is the difference between an SCM audit and a formal technical review? (7)
- OR**
- VII. Write a note on version control and change control process in SCM with neat diagrams. (15)
- VIII. (a) Explain how a productivity improvement program can be implemented in a software firm. (8)
(b) Define motivation. What are the factors affecting motivation. (7)
- OR**
- IX. (a) Describe the components of a productivity measurement system. (8)
(b) Write a note on Maslow's motivation theory. (7)



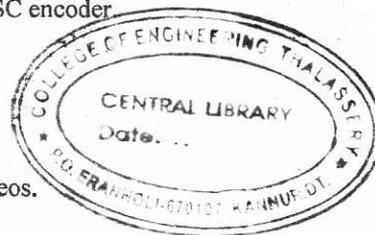
B.Tech Degree VIII Semester Examination April 2011

EC 801 AUDIO AND VIDEO ENGINEERING (2002 Scheme)

Time: 3 Hours

Maximum Marks: 100

- I. (a) Explain with necessary diagram the working of electrodynamic loud speaker. (11)
(b) Define the following terms :
(i) Loudness
(ii) Pitch
(iii) Sound synthesis (9)
- OR**
- II. (a) With the help of neat diagram explain the working of a condenser microphone. (10)
(b) What is the necessity of enclosures in a loud speaker? (4)
(c) With necessary diagram explain about speech production model used in speech synthesis. (6)
- III. (a) With the help of block diagram explain MPEG audio encoder. (12)
(b) Explain the term companding. (8)
- OR**
- IV. (a) Explain the working of a CD player. (10)
(b) Explain the principle of magnetic recording of audio signals. (10)
- V. (a) With neat block diagram explain Monochrome TV transmitter. (12)
(b) Explain the principle of CCD Camera. (8)
- OR**
- VI. (a) With the help of neat figure explain about the composite video signal. (15)
(b) Explain Interlaced scanning. (5)
- VII. (a) What is colour killer? Explain with a circuit. (10)
(b) Explain the operation of Trinitron colour picture tube. (10)
- OR**
- VIII. (a) With the help of block diagram explain NTSC encoder. (10)
(b) Compare NTSC and PAL. (6)
(c) Define the terms :
(i) Hue
(ii) Saturation (4)
- IX. (a) Explain the MPEG compression used in videos. (10)
(b) Explain HDTV and its standards. (10)
- OR**
- X. (a) Explain motion compensated video coding. (10)
(b) Write note on digital audio broadcasting. (5)
(c) Explain the importance of run length coding in video compression. (5)



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EC 802 COMMUNICATION SYSTEMS (2006 Scheme)

Time : 3 Hours

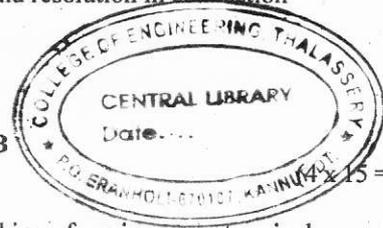
Maximum Marks : 100

PART – A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Discuss the design criteria for antennas used in microwave repeaters and transponders.
(b) What are microwave repeaters? Explain clearly with a block schematic?
(c) What are orbital perturbations? Explain? What is foot print?
(d) Explain the Direct Sound Broadcast system.
(e) What is telemetry? Explain the various types and their applications.
(f) Differentiate between Spatial resolution and Ground resolution in connection with aerial photographs.
(g) Compare TDMA, FDMA and CDMA techniques.
(h) Briefly explain 3G and Zig-Bee standards.

PART – B



- II. (a) With the help of a block diagram explain the working of a microwave terminal transmitter? (8)
(b) Discuss the impact of path loss, shadowing and multipath fading on microwave propagation. (7)
- OR
- III. (a) With the help of a block diagram explain the working of a microwave terminal receiver. (8)
(b) Explain briefly how the LOS system differs from the OTH system. (7)
- IV. (a) Write briefly about various types of Satellite orbits and Orbital parameters. (9)
(b) Write briefly about Geostationary Satellite systems and Navigation Systems. (6)
- OR
- V. (a) State Kepler's laws of planetary motion. What is their significance in satellite communication systems? (8)
(b) Explain the Direct Television Broad cast systems. (7)
- VI. With the help of neat figures explain the working of time Hopping spread spectrum and Frequency Hopping-Spread Spectrum. (15)
- OR
- VII. Explain the working of framing and scanning systems with the help of neat sketches. (15)
- VIII. (a) Discuss the GSM standard for mobile communication. How is it different from CDMA standard? Also, highlight the significance of the modulation techniques used in GSM. (7)
(b) Write briefly about GPRS and DECT systems. (8)
- OR
- IX. Write briefly about :
(i) Cell splitting and Sectoring (8)
(ii) Adjacent Channel and Co channel interference. (7)

B.Tech Degree VIII Semester Examination April 2011

EC 803 OPTO ELECTRONICS AND COMMUNICATION

(2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

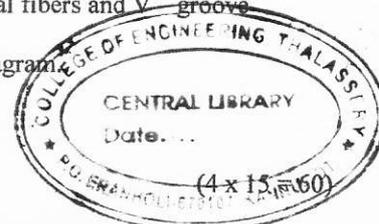
PART - A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) A multimode silica fiber has a core refractive index of $n_1 = 1.48$ and a cladding index $n_2 = 1.46$. Find the acceptance angle in air.
- (b) What are the two main causes for intramodal dispersion?
- (c) What are the advantages of using heterojunction LEDs?
- (d) A photodiode made of GaAs has a band – gap energy of 1.43 eV at 300 K. Find the cut off wavelength. Will it operate for photons having wavelength greater than 870 nm?
- (e) What are the factors to be considered while designing a link power budget?
- (f) Give the basic difference between Fusion splicing of optical fibers and V-groove optical fiber splicing technique.
- (g) Explain the working of an optical circulator with a neat diagram.
- (h) Explain the principle of working of optical CDMA.

PART - B

- II. (a) What are single mode fibers? Explain the significance of the mode – field diameter in predicting the fiber properties. (7)
- (b) Explain the polarization – mode dispersion seen in optical fibers. (8)
- OR**
- III. Discuss in detail the different techniques used for fabrication of optical fibers. (15)
- IV. (a) Define the quantum efficiency of an LED. Derive an expression for the internal quantum efficiency and optical power generated internally to the LED. (8)
- (b) Draw the simple model of a photodetector receiver along with its equivalent circuit. Explain the main factors that determine the response time of a photodiode. (7)
- OR**
- V. (a) Discuss the effect of temperature on the working of laser diodes. (7)
- (b) Briefly explain the different types of noise encountered in photodetectors. (8)
- VI. Discuss the rise - time budget analysis for determining the dispersion limitation of an optical fiber link. Derive a suitable relationship between the 3 – dB optical bandwidth and full – width half – maximum rise time (t_{FWHM}) (15)
- OR**
- VII. (a) Explain any one type of preamplifiers used in fiber optic communication with the help of a neat circuit diagram. (7)
- (b) Explain the “cut back technique” method of attenuation measurement in an optical fiber. (8)
- VIII. (a) Explain with the help of a neat block diagram the working of an optical switch. (7)
- (b) What is the method used to achieve population inversion in a semiconductor optical amplifier? Derive an expression for the steady – state gain / length of the same. (8)
- OR**
- IX. (a) Derive an expression for the power – conversion efficiency and gain of an EDFA. (8)
- (b) Explain any one type of the ring architectures used in SONET / SDH networks. (7)



B. Tech Degree VIII Semester Examination April 2011

EE 801 ELECTRICAL MACHINE DESIGN (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART – A (Answer ALL questions)

(8 x 5 = 40)

- I.
- (a) What are the guiding factors for choice of number of poles?
 - (b) Calculate the output coefficient of a dc shunt generator from the given data. $B_g = 0.89 \text{ wb/m}^2$, $a_c = 32000 \text{ amp cond/m}$ $\psi = 0.66$.
 - (c) What are the categories of transformers used in power system? Mention their uses.
 - (d) What are the factors to be considered to choose the type of winding for a core type transformer?
 - (e) What is Short Circuit Ratio of an alternator? How it affects the design of alternator?
 - (f) Mention the factors that govern the design of field system of alternator.
 - (g) Explain how choice of specific electric loading and specific magnetic loading is done for an induction motor.
 - (h) What are the factors to be considered for estimating the length of air gap in induction motor?

PART – B



- II. Determine the main dimensions, number of poles and length of air gap of a 600KW, 500V, 900 rpm generator. Assume average gap density as 0.6 wb/m^2 and ampere conductors per meter as 35000. The ratio of pole arc to pole pitch is 0.75 and the efficiency is 91%.
The following are the design constraints: peripheral speed $\nless 40 \text{ m/s}$, frequency of flux reversals $\nless 50 \text{ Hz}$, current per brush arm $\nless 400 \text{ A}$ and armature mmf per pole $\nless 7500 \text{ A}$. The mmf required for air gap is 50 per cent of armature mmf and gap contraction factor is 1.15. (15)

OR

- III. (a) What are the standard methods for reducing the effects of armature reaction? (10)
(b) What are the guiding factors for choice of number of armature slots? (5)
- IV. (a) Derive the output equation of a 3 phase transformer. (7)
(b) Calculate the core and window areas required for a 1000KVA, 6600/400V, 50HZ 1ϕ core type transformer. Assume a maximum flux density of 1.25 wb/m^2 and a current density of 2.5 A/mm^2 . Voltage per turn = 30V, window space factor = 0.32. (8)

OR

- V. Calculate the main dimensions and winding details of a 100KVA, 2000/400V, 50HZ single phase shell type, oil immersed, self cooled transformer. Voltage per turn = 10V, flux density in core = 1.1 wb/m^2 , current density = 2 A/mm^2 , window space factor = 0.33. The ratio of core depth to width to central limb = 2.5. Stacking factor is 0.9. (15)

(P.T.O)

- VI. (a) Derive the output equation of a 3 phase alternator. (7)
 (b) For a 250KVA, 1100V, 12 pole, 500 rpm, 3 phase alternator, determine air gap diameter, core length and number of stator conductors. Assume average gap density as 0.6wb/m^2 and specific electric loading 30,000 amp cond/m. $L/c = 1.5$. (8)

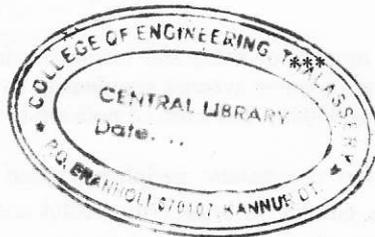
OR

- VII. Determine the main dimensions of a 75MVA, 13.8KV, 50HZ, 62.5 rpm 3 phase star connected alternator. Also find the number of slots, conductors per slot, conductor area and work out the winding details. The peripheral speed should be about 40m/s. Assume average gap density = 0.6swb/m^2 , ampere – conductor per meter is 40000 and current density is 4A/mm^2 . (15)

- VIII. Estimate the stator core dimensions, number of stator slots and number of stator conductors per slot for a 100KW, 3300V, 50HZ, 12 pole star connected slip ring induction motor.
 Assume : air gap density = 0.4wb/m^2 , ampere conductors per metre = 25000 A/m. efficiency = 0.9, power factor = 0.9 and winding factor = 0.96. Choose main dimensions to give best power factor. The slot loading should not exceed 500 ampere conductors. (15)

OR

- IX. (a) What are the methods adopted to reduce harmonic torques? (6)
 (b) A 11KW 3 phase 6 pole 50HZ 220V star connected induction motor has 54 stator slots, each containing 9 conductors. Calculate the values of bar and end ring currents. The number of rotor bar is 64. The machine has an efficiency of 0.86 and a power factor of 0.85. The rotor mmf may be assumed as 85 per cent of stator mmf. Also find the bar and end ring sections if the current density is 5A/mm^2 . (9)



B.Tech Degree VIII Semester Examination April 2011

EE 802 POWER SYSTEMS III (2006 Scheme)

Time : 3 Hours

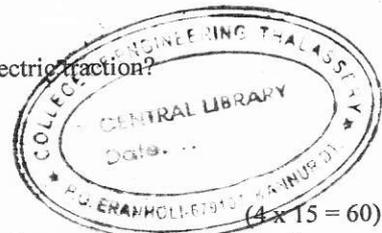
Maximum Marks : 100

PART - A

(Answer ALL questions)

(8 x 5 = 40)

- I. (a) What are the functions of the operating mechanism of circuit breakers?
 (b) Differentiate between switching and lightning surges.
 (c) List out the important protective schemes incorporated in generator protection.
 (d) Explain the characteristics of IDMT relay.
 (e) What are the advantages of electric heating?
 (f) What are the factors affecting the schedule speed of electric traction?
 (g) Define the term energy audit and explain its need.
 (h) Discuss the important voltage quality issues.



PART - B

(4 x 15 = 60)

- II. (a) Explain the working of spring opened, spring closed operating mechanism of circuit breakers. (5)
 (b) With suitable sketches, explain in detail the working of SF₆ circuit breakers. (10)
- OR**
- III. (a) Discuss the important rated characteristics of circuit breakers. (7)
 (b) Derive expressions to show that, when a transmission line is terminated through a resistance equal to the surge impedance, the travelling wave does not suffer reflections. (8)
- IV. (a) What are the basic requirements of protective relaying? (7)
 (b) With the help of a neat sketch, discuss the working principle of induction disc type relay. (8)
- OR**
- V. (a) Discuss the working of static relay with the help of block diagram. (5)
 (b) Explain how the differential protection can be incorporated to protect a delta / star grounded transformer against internal faults. (10)
- VI. (a) Differentiate between the speed – time curves of train movement for the urban and main line services. (5)
 (b) An electric train has an average speed of 42 Km/h on level track between stops 1400 m apart. It is accelerated at 1.7 Km/h² and is braked at 3.3 Km/h². Draw the speed – time curve for the run. (10)
- OR**
- VII. (a) Explain the principle of dielectric heating. List out major applications. (5)
 (b) Dielectric heating has to be employed to heat a slab of insulating material 20 mm thick and 1530 mm² in area. Power required is 200 Watts and frequency of 3 MHz is to be used. The material has a permittivity of 5 and a power factor of 0.05. Determine the voltage required and the current that has to flow through the material. (10)
- VIII. (a) Discuss the methodology to be followed in conducting :
 (i) Preliminary energy audit (8)
 (ii) Detailed energy audit (7)
 (b) Discuss the important energy conservation measures in electric motors. (7)
- OR**
- IX. (a) List out the important sources that produce harmonic currents. (5)
 (b) Discuss the working principle of harmonic filters used in variable speed drives. (10)

B. Tech Degree VIII Semester Examination April 2011

EE 804 (B) RENEWABLE SOURCES OF ENERGY (2006 Scheme)

Time : 3 Hours

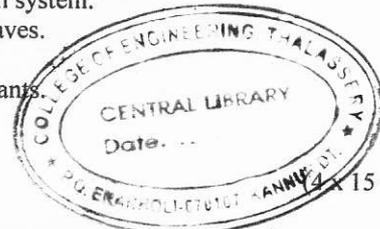
Maximum Marks : 100

PART – A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Discuss the issue of global warming.
(b) With a neat sketch, explain the working of solar cooker.
(c) Explain the concept of photovoltaic effect.
(d) Discuss about the different types of solar cell materials.
(e) With a neat sketch explain the wind energy conversion system.
(f) Discuss about the energy and power obtained from waves.
(g) Explain the classification of biomes.
(h) Write a short note on micro and mini hybrid power plants.

PART – B



- II. (a) Explain the differences between renewable and non-renewable sources of energy. (6)
(b) Explain the different types of solar still water heaters. (9)
- OR**
- III. (a) With a neat sketch explain the working of solar furnace. (5)
(b) Briefly describe the various solar thermal power generation systems. (10)
- IV. (a) Discuss about the electrical characteristics of silicon PV cells. (5)
(b) Explain about the different instruments used for measuring solar radiation. (10)
- OR**
- V. (a) Discuss about the various applications of solar photovoltaic system. (5)
(b) Explain the empirical equations for predicting the availability of solar radiation. (10)
- VI. (a) Briefly explain site selection consideration for wind energy conversion system. (5)
(b) Discuss about the different types of wave energy conversion devices. (10)
- OR**
- VII. Discuss about the different types of wind turbines. Also compare their performance. (15)
- VIII. (a) Explain the principle of MHD power generation. Also give the applications of MHD generators. (6)
(b) Discuss about the different types of fuel cells. (9)
- OR**
- IX. Explain about the different types of ocean thermal conversion systems. (15)

B.Tech Degree VIII Semester Examination April 2011**ME 801 OPERATIONS MANAGEMENT**
(2006 Scheme)

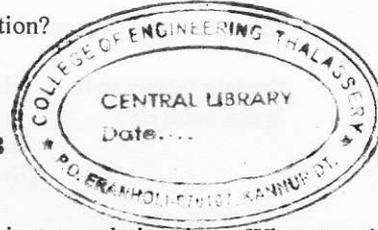
Time : 3 Hours

Maximum Marks : 100

PART - A
(Answer ALL questions)

(8 x 5 = 40)

- I. (a) What is 'Crashing' in Network Techniques?
 (b) List the different types of Forecasting methods.
 (c) Write notes on 'Product Design'.
 (d) Explain 'Bin Card' system.
 (e) List factors influencing scheduling.
 (f) Describe 'Gantt Chart'.
 (g) What are the factors influencing plant location?
 (h) Write notes on Material Handling.

**PART - B**

(4 x 15 = 60)

- II. Draw the PERT network. Calculate project completion time. What are critical activities? What are different paths and their timing?

Predecessor Activity	A	B	C	D	E	F	G	H	I
Successor Activities	CE	DH	FG	FG	I	I	-	-	-
Completion Time	12	9	4	0	6	13	7	8	10

OR

- III. List different Forecasting Techniques. Explain any three methods in detail.

- IV. Briefly explain :

- (i) Product Life Cycle
 (ii) Functions of PPC (Production Planning and Control)

OR

- V. A manufacturer gets an order of 24000 units of one of his product for a year. The supply should be instantaneous. The customer does not maintain any buffer stock, so he will not tolerate any shortage in supply. The inventory holding cost is 10% of unit cost and the set up cost of machine, fixture etc. is Rs. 350/- per run..
 Find the optimum size of production lot for minimum total cost. How many runs will be required for this and the duration of each run? What is the cycle time?
 Assume the capacity of equipment as 3000 units per month. Each unit costs Rs. 5/-

(P.T.O.)

- VI. A book binder has one printing press one binding machine and manuscripts of 7 different books. The times required for performing printing and binding operations for different books are shown below :

Book	Printing Time (Days)	Binding Time (Days)
1	20	25
2	90	60
3	80	75
4	20	30
5	120	90
6	15	35
7	65	50

Decide the optimum sequence of processing books in order to minimize the total time required to turn out all the books. Name the model used.

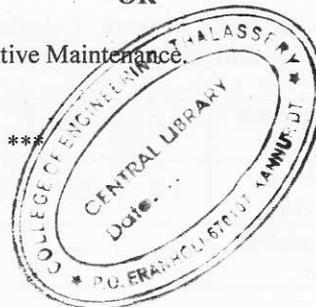
OR

- VII. Describe basic concept of sequencing and "2 machines 'n' jobs" in detail.

- VIII. (a) Explain factors to be considered in design of plant layout.
 (b) Write notes on :
 (i) Production rate determination
 (ii) Employee requirement

OR

- IX. (a) Explain the procedure of Preventive Maintenance.
 (b) What is 'depreciation'?



B. Tech Degree VIII Semester Examination April 2011

ME 802 COMPRESSIBLE FLUID FLOW (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART A

(Answer ALL questions)

(8 x 5 =40)

- I. (a) Derive an expression for the speed of acoustic wave propagation.
 (b) Describe the behaviour of flow in a convergent-divergent nozzle when it is operated at various pressure ratios.
 (c) Derive the Rankine-Hugoniot relation for the flow through a normal shock..
 (d) Explain the significance of $\theta - \beta - M$ curve (θ - deviation angle, β - shock angle and M - Mach number) for flow with oblique shocks.
 (e) Derive an equation describing a Fanno curve. Represent Fanno curves on the temperature-entropy coordinates at different mass flow densities.
 (f) Prove that the Mach numbers at the maximum enthalpy and maximum entropy points on the Rayleigh line are $1/\sqrt{\gamma}$ and 1.0 respectively.
 (g) Explain why the throat area of the diffuser in a supersonic wind tunnel is larger than the nozzle throat area.
 (h) Obtain the Rayleigh supersonic pitot formula for determining Mach number of supersonic flows.



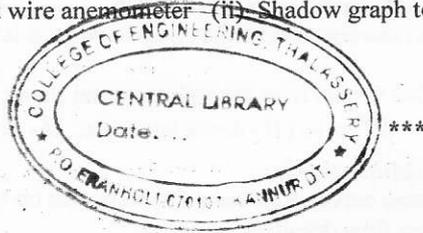
PART B

(4 x 15 = 60)

- II. (a) Derive an expression for the maximum mass flow rate through a nozzle. (5)
 (b) Air is discharged from a reservoir at $P_0 = 7$ bar and $T_0 = 600K$ through a nozzle to an exit pressure of 1 bar. If the mass flow rate is 1 kg/s, determine for isentropic flow, (10)
 (i) pressure, velocity and area at the throat (ii) exit area and Mach number.
- OR
- III. (a) Derive an expression for area ratio as a function of Mach number. (5)
 (b) Air at 300K and 1 bar enters a diffuser with a velocity of 245 m/s. The diffuser is to be designed to reduce the velocity of air to 60 m/s. The mass flow rate through the diffuser is 13.6 kg/s. Assuming flow to be isentropic, determine (i) inlet diameter (ii) outlet diameter (10)
 (iii) rise in static temperature.
- IV. (a) Derive an expression for the change in entropy in terms of stagnation pressure ratio across a normal shock. (5)
 (b) The state of air flow upstream of a normal shock wave is $M=2.5$, $P=2$ bar and $T=275$ K. Determine the Mach number, pressure, temperature and velocity of the flow downstream of the shock. Check the calculated values with those obtained from the gas tables. (10)
- OR
- V. (a) Derive the Prandtl Meyer relation for the flow through an oblique shock. (5)
 (b) Supersonic flow of air at $M=3$, $P=100kPa$ and $T=300K$ is deflected through 20° at a compression corner. Determine the shock wave angle and the flow properties (P , T and M) downstream of the shock. What is the percentage loss in stagnation pressure? (10)

(P.T.O)

- VI. Air enters a 3 cm diameter pipe with stagnation pressure and temperature of 100 kPa and 300K and velocity of 100 m/s. Compute (i) the mass flow rate (ii) the maximum pipe length for this mass flow rate (iii) mass flow rate for a pipe length of 14.5m. Take $f = 0.02$. (15)
- OR**
- VII. Air enters a combustion chamber at 69 m/s, 300K and 150 kPa, where 900 kJ/kg of heat is added. Determine (i) the mass flow rate per unit duct area (ii) exit properties (P , T , P_0 , T_0) (iii) inlet Mach number if the heat added is 1825kJ/kg. (15)
- VIII. Explain the working of the following with neat figures: (i) Shock tube (ii) Laser Doppler velocimeter (iii) Closed circuit wind tunnel. (15)
- OR**
- IX. Explain the working of the following with neat figures: (i) Hot wire anemometer (ii) Shadow graph technique (iii) Schlieren apparatus. (15)



B. Tech Degree VIII Semester Examination April 2011

ME 803 PRODUCTION TECHNOLOGY (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART – A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Mention the various limitations of Electro Discharge Machining process in metal cutting.
(b) What are the advantages of Chemical Milling process? Mention few areas where Chemical Milling is used.
(c) What is meant by speed diagram? Draw all possible distributions of speeds for a 2 x 3 system.
(d) Explain 'stepped' and 'stepless' regulation of speeds.
(e) Mention the advantages and limitations of powdered metals.
(f) Explain the process of 'Atomization' in the preparation of metal powders.
(g) Give a brief description on the various types of fluid logic elements.
(h) Explain the hydraulic circuit of shaper machine with suitable sketch.

PART – B

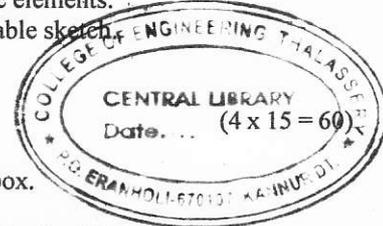
- II. Explain the procedure followed in the design of a speed box.
OR
III. With the help of a neat sketch explain the working of a Positive Infinitely Variable drive.

- IV. A hole of 1.83 mm diameter is to be drilled to a depth of 7.48mm in steel sheet by EDM method using brass electrode. The surface finish required is to be 20 micron. Determine the source voltage to be set up for an R-C circuit setting of 100 ohms and 120 micro-farads respectively. Also find out the time required for drilling. Assume sparking period as 100 μ -sec.
Take discharging power = 0.8 times power delivered. Given surface roughness = $K_1 \left(\frac{1}{2} CU^2 \right) K_2 t_p K_3$ microns, where K_1, K_2, K_3 are constants, values depending on electrode and workpiece are respectively 13, 0.45 and 0.22. C \rightarrow Capacitance of condenser in farads, U \rightarrow Voltage across capacitor, t_p \rightarrow pulse duration in μ -sec.

$$\text{Metal removal rate (MRR)} = 1.42 t_c U^2 \text{ mm}^2 / \text{sec} (t_c \rightarrow \text{charging time})$$

OR

- V. A hole is to be drilled in a 20mm thick tungsten carbide sheet by ultrasonic method. The slurry is made of boron carbide (15 micron radius) mixed with water. The static stress is 1.4kg/cm² and the amplitude of tool oscillation is 0.025mm. The machine operates at 25,000 cycles/sec. The compression fracture strength of WC is 225 kg/mm². Calculate the time required to perform drilling. Assume that one out of ten pulses are effective. Consider $MRR = 5.9 f (R y_0)^{3/2} (\sigma / H)$ where f = frequency in c.p.s., R = Radius of grit in mm, y_0 = amplitude of oscillation, σ = stress developed in tool in kg/mm², $H = \square \times$ Fracture strength.



(P.T.O)

- VI. Explain the method by which Tungsten carbide tools are manufactured.
- OR**
- VII. Discuss the various advantages and disadvantages of Powder Metallurgy.
- VIII. Estimate the total time required for machining a mild steel rod of diameter 40mm and length 150mm as per requirements given. 80mm length to be turned to 35mm and 30 mm length of 35mm diameter to be turned to 30mm diameter. Depth for rough cut to be not more than 1mm. A finishing cut of depth 0.5mm to be given. Cutting speed = 60m/min. Feed = 0.8mm/min.
- OR**
- IX. Discuss the procedure for estimating the cost of a product produced in a foundry shop.



B.Tech Degree VIII Semester Examination April 2011

ME 804 (E) AUTOMOBILE ENGINEERING (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART - A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Explain engine balancing.
(b) Explain the arrangements to avoid piston slap.
(c) Explain a carburetor with compensation jet.
(d) Explain ignition advance methods.
(e) List various types of automobile frames and explain any one.
(f) Explain epicyclic gear box.
(g) Explain variable velocity joint and constant velocity joint ^{universal coupling}.
(h) Explain requirements of a good braking system.

PART - B

- II. (a) Explain the working of a 2 stroke 4 cylinder CI engine. (7)
(b) Explain various types of combustion chambers in SI engines. (8)
- OR**
- III. (a) Explain and correlate the actual valve timing diagram and indicator diagram of a 4 stroke SI engine. (10)
(b) Explain the effects of pre – ignition in SI engines. (5)
- IV. (a) A simple jet carburetor is required to supply 4.6 kg of air per minute. The pressure and temperature of air are 1.013 bar and 298K respectively. Assuming flow to be isentropic and compressible, calculate the throat diameter for air flow velocity of 85 m/s. Take velocity coefficient as 0.85. (10)
(b) Explain the advantages and disadvantages of air cooling system. (5)
- OR**
- V. (a) Fuel injection in a single cylinder, 4 – stroke CI engine running at 600 rpm takes place through a single orifice nozzle and occupies 28 degree of crank travel. The fuel consumption of the engine is 2.8 Kg/hr and the fuel used has a specific gravity of 0.9. If the injection pressure is 150 bar and the combustion chamber pressure is 32 bar estimate the volume of fluid injected per cycle and the diameter of the orifice. Take Cd of the orifice as 0.85. (10)
(b) Compare battery and magnetic ignition systems. (5)
- VI. (a) Explain the functions and types of vehicle frame. (10)
(b) Explain the requirements of transmission system. (5)
- OR**
- VII. (a) Explain semi centrifugal clutch. (7)
(b) Explain sliding mesh gear box showing gear positions for *any two* speeds. (8)
- VIII. (a) Explain various types of automotive springs in suspension systems quoting their relative merits. (10)
(b) Explain stopping distance and fading of brakes. (5)
- OR**
- IX. (a) Explain the fundamental equation for correct steering. (7)
(b) Explain hydraulic braking system in automobiles. (8)