**5501/3**

**FACULTY OF ENGINEERING & TECHNOLOGY**

**B.Tech. (EEE) VIII-Semester (CBCS) Examination**

**Open Elective- III (c)**

**INFORMATION SECURITY**

Time: 3 Hours] [Max. Marks: 70

**Section – A (Marks: 10x1=10)**

**Answer all questions.**

1. (a). Define active and passive attacks.
   (b). What is steganography?
   (c). Define linear cryptanalysis.
   (d). Write about electronic code book mode?
   (e). What is message authentication code.
   (f). Define biometric authentication.
   (g). Write about IP Security.
   (h). What is secure socket layer?
   (i). How to manage password(s)?
   (j). What is firewall?

**Section – B (Marks: 5x12=60)**

Answer any **Five** questions

2. (a). Compare and Contrast between symmetric and asymmetric key cryptography.

   **OR**

   (b). Discuss any three substitution techniques.

3. (a) Explain about classical crypto systems with suitable examples?

   **OR**

   (b) Discuss how encryption and decryption are done using Blowfish algorithm?

4. (a) Explain the AES algorithm.

   **OR**

   (b) What is Elliptic Curve Cryptography (ECC)? Discuss ECC algorithm with diagram.

5. (a) Explain Secure Hash function? List out its properties.

   **OR**

   (b) Discuss briefly RSA Algorithm with an example.

6. (a) Briefly explain the characteristics and operations of RC4 Encryption algorithm.

   **OR**

   (b) Differentiate linear and differential crypto-analysis.

7. (a) Elaborate firewall design principles and types of firewalls.

   **OR**

   (b) Explain the approaches for Digital Signatures based on Public Key Encryption

8. (a) Explain DES algorithm with neat sketches.

   **OR**

   (b) Write a note on “Conventional Encryption Model”.

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**5504/3**

**FACULTY OF ENGINEERING AND TECHNOLOGY**

**B.Tech. (Civil) VIII-Semester (CBCS) Examination**

**Prof.Elective-VII (a)**

# Advanced Concrete Technology

**Time: 3 Hours]** **[Max. Marks: 70**

**Section-A (Marks: 10x1=10)**

Answer all questions

1 a) Define self-curing concrete.
b) Define creep and shrinkage.
c) What is aggregate phase in concrete?
d) Define deterioration of concrete.
e) What is mass concrete?
f) What is 3D printing in construction?
g) What is slip form construction?
h) What does infrared thermography mean?
i) What is ground penetrating radar?
j) Define adsorbed and interfacial water

**Section-B (Marks: 5x12=60)**

Answer any **Five** questions

2 a) Explain the Relationship between micro structure and properties of concrete.

(OR)

b) Discuss hydration reactions of different cement compounds.

3 a) Define creep. List the factor effecting creep (6)
b) Explain factor effecting durability of concrete. (6)

(OR)

c) Describe the influence of various components of high strength concrete.

4 a) Explain any two methods for testing fresh stage properties of self-compacting concrete.

(OR)

b) Explain the design procedure of DOE method.

Contd..2..

5 a) Discuss about prefabrication techniques, precast concrete and its ingredients.

(OR)

b) Explain about MIVAN shuttering and write its merits and demerits.

6 a) Explain briefly causes of corrosion of steel in concrete.

(OR)

b) Discuss about the UPV method and write its limitations.

7 a) What is the influence of prefabrication technology on modern construction industry?

(OR)

b) Explain Schmidt's rebound hammer test to assess the strength of concrete.

8 a) Explain the composition, properties and uses of high strength Concrete

(OR)

b) Discuss the step by step procedure for mix design of ACI method.

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**5506/3**

**FACULTY OF ENGINEERING AND TECHNOLOGY**

**B.Tech. (Civil) VIII-Semester (CBCS) Examination**

**Prof. Elective-VII (c)**

**WATERSHED MANAGEMENT**

**Time: 3 Hours]** **[Max. Marks: 70**

**Section-A (Marks: 10 x 1= 10)**

Answer all questions

1 a) What is a watershed?
b) Explain different methods of geometric representation of watershed.
c) What are the effects of erosion on land fertility and land capability?
d) Give the difference between dam and check dam.
e) List out the objectives on land capability.
f) Write a note on social forestry.
g) What is a role on Ecosystem?
h) List out the different types of erosion.
i) What are the various types of rain water harvesting?
j) What is land use and land cover?

**Section-B (Marks: 5 x 12= 60)**

Answer any **Five** questions

2 a) Explain in detail about the integrated watershed management approach.

(OR)

b) Explain the necessity of watershed management in India. list out the principles of watershed management.

3 a) Classify the various watershed characteristics & its importance in watershed Management.

(OR)

b) Give a brief explanation on hydrology and socio-economic characteristics of watershed.

4 a) Discuss in detail about erosion control methods:
i) Furrowing ii) Ploughing iii) Rockfill dams.

(OR)

b) List out the climatic factors that influence the Erosion.

5 a) Write a short on reclamation of saline and alkaline soils.

(OR)

b) Describe the role of check dam, farm ponds and percolation tanks in rain water harvesting.

6 a) Discuss the role of ecosystem and bio-mass management.

(OR)

b) What is crop husbandry and sustainable agriculture? Explain them.

7 a) Discuss about the land capability classification.

(OR)

b) Write a short note on check dam and farm ponds.

8 a) Explain universal soil loss equation in detail.

(OR)

b) Discuss about different runoff measuring devices in watershed.

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5511/3

FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Mech Engg) VIII-Semester (CBCS) Examination

Prof. Elective-V (a)

Non Destructive Testing

Time: 3 Hours] [Max. Marks: 70

Section-A (Marks: 10 x 1= 10)

Answer all questions

1 a) What are the objectives of Non-Destructive Testing

b) What are properties of a good penetrant?

c) How coil arrangement effects eddy current test.

d) What are the limitations of magnetic particle inspection?

e) List applications of ultrasonic testing.

f) List the advantages and disadvantages of ultrasonic testing.

g) What are the properties of X-and Gamma Rays

h) Discuss about safety precautions in radiography.

i) What are applications of neutron radiography?

j) What is thermography?

Section-B (Marks: 5 x 12 = 60)

Answer any **Five** questions

2 a) Explain the principle of liquid penetrant testing. Discuss the various penetrant systems.

(OR)

b) Explain the Liquid Penetrant Inspection with flow chart. Clearly mention the advantages, disadvantages and applications of liquid penetrant testing.

3 a) Explain the magnetic particle test in detail. Discuss the importance of demagnetization step in the test.

(OR)

b) Explain the principle of eddy current testing and list the properties of eddy current. What is the relation between frequency and depth of penetration in eddy current testing.

4 a) State the principle of ultrasonic test. Differentiate between pulse echo technique and through transmission technique.

(OR)

b) Discuss about normal and angle beam testing. Explain different data presentation techniques in ultrasonic test.

5 a) State the principle of radiography testing. Explain the source of X rays and gamma rays.

(OR)

b) Discuss the various radiographic inspection procedures briefly.

Contd..2..

6 a) Explain the principle of Acoustic emission test and sources of emission.

(OR)

b) Explain the principle of thermography with a neat sketch

7 a) Explain the principle of magnetic particle testing. What are its advantages and limitations.

(OR)

b) List the stages in liquid penetration test. Discuss the properties of developer and importance of developer time.

8 a) What is ultrasonic testing? Give its advantages, limitations and applications.

(OR)

b) Explain the technique of excess removal of penetrant from the work piece surface.

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# FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Mech Engg) VIII-Semester (CBCS) Examination

Prof. Elective-V (c)

TRIBOLOGY

Time: 3 Hours] [Max. Marks: 70

Section–A (Marks: 10x1=10)

Answer all questions

1 a) Is it always desirable to reduce friction?

b) Define viscosity index.

c) What is meant by hydrostatic lifts

d) Explain the terms in Reynolds three-dimensional equation

e) What is the importance of minimum oil film thickness in hydrodynamic lubrication

f) Discuss about Sommer-field number

g) Name the types of bearing materials

h) What is meant by dry friction

i) What do you understand by concentric bearings

j) What is meant by heat balance in bearings

Section–B (Marks: 5x12=60)

Answer any **Five** questions

2. a) Define dynamic viscosity. Discuss temperature dependence of viscosity.

Or

b) Discuss about hydrostatic step bearing

3. a) Explain hydrodynamic lubrication theory to journal bearing

Or

b) Explain about petroffs equation for lubrication. Discuss its limitations

4. a) Discuss about friction in concentric bearings

Or

b) Explain the practical considerations in Journal bearing design

5. a) Differentiate between hydrodynamic journal bearing and hydrodynamic thrust bearing

Or

b) Discuss the compressibility effect in hydrostatic bearings

6. a) Explain about externally pressurized bearings

Or

b) Explain the material selection process for bearing applications

7. a) Define viscosity. Explain the procedure to determine viscosity.

Or

b) Differentiate between hydrostatic lubrication and hydrodynamic lubrication

8. a) What are the advantages and disadvantages of hydrodynamic thrust bearing

Or

b) Discuss about hydrostatic wick oiled bearings.

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**5524/3**

# FACULTY OF ENGINEERING AND TECHNOLOGY

**B.Tech. (EEE) VIII-Semester (CBCS) Examination**

**Open Elective-III (b)**

**Embedded System Design**

**Time:3 Hours]** **[Max Marks:70**

Section- A (Marks: 10x1=10)

Answer all questions

1. a) Write about maintenance in embedded system.
   b) How upgradation is performed in embedded design.
   c) Explain ARM design philosophy.
   d) Describe ARM processor fundamentals.
   e) What is processing system in ARM CORTEX?
   f) Write about zynq.
   g) What is host and target machine?
   h) Explain cross compilers.
   i) What are mailboxes?
   j) Explain pipes in RTOS.

Section- B (Marks: 5x12=60)

Answer any **Five** questions

2. a) Describe in detail about embedded design life cycle.

   OR

   b) Explain about hardware and software design including selection of processor.

3. a) Write a short note on pipeline and interrupts in ARM processor.

   OR

   b) Describe in short about RISC design philosophy.

4. a) Explain various types of FPGA in market.

   OR

   b) Describe in detail about programmable logic interfaces in ARM CORTEX.

5. a) What are Tool chains and linkers in embedded software.

   OR

   b) Explain about locator maps in embedded software development tools.

6. a) Write a short note on tasks and data in RTOS.

   OR

   b) Explain about RTOS semaphores and shared data.

7. a) What is product testing and releasing? Explain in detail.

   OR

   b) Explain about memory management in Real time operating systems.

8. a) What is current program status register in ARM embedded system.

   OR

   b) Write a case study of Xilinx FPGA using embedded processing.

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5525/3

FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech (EEE) VIII-Semester (CBCS) Examinations

START-UP ENTREPRENEURSHIP

Open Elective-III (d)

Time: 3 Hours] [Max. Marks: 70

**Section-A (Marks: 10 x 1 = 10)**

Answer all Questions

1 a) Define Creativity.
b) Define discovery and delivery skills.
c) What is Activity Mapping?
d) What is the meaning of "Converting risk as opportunity".
e) Define Start-up Ecosystem.
f) What is the meaning of "Sharing knowledge".
g) Give the relation between Products and Services.
h) What is "Known Business Plan"?
i) What is the meaning of Cash Flow Statement?
j) What do you mean by "Preparation of Risk Map"?

**Section-B (Marks: 5 x 12 = 60)**

Answer any **Five** questions

2 a) Define creativity and describe the different ways of self test creativity.

**OR**

b) Explain the process of the collection of wild ideas and how can you select the best idea.

3 a) Explain validation of Ideas using Cost and Strategy.

**OR**

b) How can you visualize the business through value profile and activity mapping?

4. a) Discuss the marketing transforming strategies.

**OR**

b) What do you understand by Startup Ecosystem?

5. a) Explain the contents of Non-business plan.

**OR**

b) Discuss about information gathering process.

6. a) Explain the process of cash flows statements.

**OR**

b) Explain in detail "Preparation of business plan".

7. a) Explain the management of trade off between discovery and delivery.

**OR**

b) Explain the process of taking the risks as opportunities.

8. a) Explain "the role of failure in achieving the success".

**OR**

b) How can you go through with a revision of the original product or service idea?

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**FACULTY OF ENGINEERING AND TECHNOLOGY**

**B.Tech. (ECE) VIII-Semester (CBCS) Examination**

**Prof. Elective-VI (a)**

**Wireless Sensor Networks**

**Time: 3 Hours]** **[Max. Marks: 70**

**Section-A (Marks: 10 x 1= 10)**

Answer all questions

1 a) What is wireless spectrum? Explain.
b) What is wireless internet?
c) Define wireless sensor network.
d) What is data dissemination?
e) Explain about clustering.
f) Define Localization.
g) Define routing protocol.
h) Classify routing protocols.
i) What is battery scheduling?
j) Write about system power management schemes.

**Section-B (Marks: 5 x 12= 60)**

Answer any **Five** questions

2 a) Discuss in detail about various multiple access techniques.
(OR)
b) Write short notes on wireless LAN, MAN and WAN.

3 a) What are the various applications of wireless sensor networks? Explain.
(OR)
b) Explain various issues in Ad-hoc wireless networks.

4 a) Discuss various design goals of a MAC protocol for Ad-hoc Wireless Networks.
(OR)
b) Explain in brief about classification of MAC protocols.

5 a) Explain the routing protocol design issues in WSNs.
(OR)
b) Explain about power-aware routing protocols.

6 a) Discuss issues and challenges in providing QOS for sensor networks.
(OR)
b) Explain need for Energy Management in Wireless sensor Networks.

7 a) Discuss in detail various modulation techniques.
(OR)
b) Explain about unique constraints and challenges and advantages of ad-hoc/sensor network.

8 a) Explain about IEEE 802.15.4 MAC protocol.
(OR)
b) Explain Ad Hoc On-Demand Distance Vector Routing Protocol (AoDV).

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech.(ECE) VIII-Semester (CBCS) Examination

Prof. Elective-VI (c)

System on Chip Design

Time: 3 Hours] [Max. Marks: 70

Section-A (Marks: 10x1=10)
Answer all questions

1 a) Name some components of system architecture.
b) What are the characteristics of Memory?
c) What is the purpose of control logic in processor?
d) What is mean by orthogonal instruction?
e) What is the function of barrel shifter?
f) What happed if the CPI relative to a 3-stage core is reduced?
g) What is the function of break point registers?
h) What is ARMulator?
i) How improve the efficiency of cache memory?
j) What are the advantages of fully associative cache?

Section-B (Marks: 5x12=60)
Answer any **Five** questions

2 a) What are the different interrupt controllers used in SoC systems? Explain them. (6)
b) What are the different components of SoC system and what are the functions of them? (6)

(OR)

c) Explain the different approaches of design of SoC systems. (12)

3 a) What are the basic components needed to build a simple form of processor? (6)
b) What are the different forms of instructions that have been used in the processor? Explain them with examples. (6)

(OR)

c) What are the different addressing modes support by processor? Explain them. (6)
d) What are the features that rejected by Arm processor designers compared to RISC designers? (6)

4 a) How 3-stage pipeline ARM organization differ from 5-stage pipeline ARM organization? (4)
b) Explain the organization of an ARM with a 5-stage pipeline with neat structural diagram. (8)

(OR)

Contd..2..

| | | | |
|---|---|---|---|
| | c) | How extension of instruction set of ARM can be obtained by coprocessors? | (6) |
| | d) | What are the typical uses of coprocessor register transfer instructions? | (6) |
| 5 | a) | Draw the basic ARM memory system and explain it. | (6) |
| | b) | How the AMBA offers a systematic way to connect hardware components together on a chip? | (6) |
| | | (OR) | |
| | c) | Explain the AHB multiplexed bus scheme for high performance systems with neat architecture. | (8) |
| | d) | What are the different components defined by the reference peripheral specification? | (4) |
| 6 | a) | How to trade off between the memory size and speed? Explain with example. | (6) |
| | b) | What are the different ways to build cache? Explain them. | (6) |
| | | (OR) | |
| | c) | How a set-associative cache reduce the problems due to contention by enabling a particular memory item to be stored in more than one cache location and explain working of a 2 way set-associative cache with neat diagram. | (12) |
| 7 | a) | Explain the structure of the ARM cross-development toolkit with neat diagram. | (6) |
| | b) | How a coprocessor is used to control on-chip functions on ARM processor? | (6) |
| | | (OR) | |
| | c) | Draw the circuit diagram of ROM wait state generator and explain its functioning with neat timing diagrams. | (12) |
| 8 | a) | What are the functions of ARM coprocessor used in Piccolo coprocessor for signal processing? | (6) |
| | b) | What type of problems is solved by JTAG architecture in VLSI production testing? | (6) |
| | | (OR) | |
| | c) | Compare a unified cache and Harvard caches with neat diagrams and their functionality. | (12) |

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (VIII-Semester) CBCS Examination

Prof. Elective-VI (d) ECE / Open elective-III (a) EEE

Optimization Techniques

Time: 3 Hours] [Max. Marks: 70

Section-A (Marks: 10x1=10)

Answer all questions

1. a) Write short notes on objective function.

   b) Write any two properties of vectors.

   c) Briefly define multivariable Optimization algorithm.

   d) Write one test function for single variable optimization.

   e) Write the drawbacks of line search algorithm.

   f) Write the merits of Least Square algorithm.

   g) Define crossover in GA.

   h) Write short notes on the applications of GA.

   i) Write short notes on classical DE.

   j) Define Mutation in DE.

Section-B (Marks: 5x12=60)

Answer any **Five** questions

2. a) Explain the classification of optimization problems.

   (OR)

   b) Explain the overview of various Optimization Techniques.

3. a) Explain in detail single variable optimization with relevant example.

   (OR)

   b) Explain the simplex optimization technique.

4. a) Explain the general properties of minimization algorithms.

   (OR)

   b) Write short notes on the Newton's Method

5. a) Explain the working principle of Genetic Algorithm with one application.

   (OR)

   b) Write short notes on the design of PSO algorithm using computational statistics.

6. a) Explain the working of classical DE.

   (OR)

   b) Explain in detail TLBO, and mention its applications.

7. a) Write short notes on basic PSO.

   (OR)

   b) Write short notes on active constraints Vs inactive constraints.

8. a) Explain in detail line search algorithm.

   (OR)

   b) Write the properties of vectors and norms.

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**5531/3**

**FACULTY OF ENGINEERING AND TECHNOLOGY**

**B.Tech. (VIII-Semester) CBCS Examination**

**(Common for Prof. Elective-VII a) CSE / b) IT)**

**Data Science**

**Time: 3 Hours]** **[Max. Marks: 70**

**Section-A (Marks: 10x1=10**

**Answer all questions**

1. a) Write any two applications of Data Science in healthcare domain.
   b) Define Data and data set.
   c) Define data management.
   d) What are outliers in data?
   e) Define Bayes's Theorem.
   f) Define Univariate analysis
   g) List structured data types used in data visualization?
   h) What are Retinal variables?
   i) Which type of Bokeh plot is used for creating scatter plots?
   j) What is Data visualization?

**Section – B (Marks: 5x12=60)**

Answer any **Five** questions

2. a) Explain the Data Science Process.

   OR

   b) What are the types of data that are used in Data Science for Analysis?

3. a) What is data exploration? Describe briefly the steps of data exploration?

   OR

   b) Explain the various methods of data collection.

4. a) Describe statistical methods used in data analysis with suitable examples?

   OR

   b) Explain SVM machine learning algorithm with example.

5. a) Discuss various data visualization Techniques.

   OR

   b) What are retinal variables? How they can be used to encode data in a visual display.

6. a) Write a short note on i) Bokeh ii) Application development methods

   OR

   b) Describe the various recent trends in data collection and

7. a) Write the formula for Bayes Theorem and explain Naïve Bayes classifier with necessary example.

   OR

   b) Explain Data pre-processing steps involved in Data Science.

8. a) Explain briefly the major applications of data science

   OR

   b) What is fixing data? How data fixing is done in data science?

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**5532/3**

**FACULTYOF ENGINEERING AND TECHNOLOGY**
**B.Tech. (IT) VIII-Semester (CBCS) Examination**
**Prof.Elective-VII (a)**
MACHINE LEARNING

Time: 3 Hours] [Max. Marks: 70

Section-A (Marks: 10x1=10)
Answer all questions

1 a) Write the attributes of learning problem.
b) Write the need of machine learning.
c) Define regression.
d) What is outlier?
e) Write the disadvantages of decision tree.
f) What is conditional probability?
g) Define information gain.
h) Define space search and hypothesis.
i) What is radial basis function?
j) Define activation function.

Section-B (Marks: 5x12=60)
Answer any **Five** questions

2 a) .Explain steps to design a learning system in detail.
OR
b) Explain applications and features of machine learning.
3 a) What is regression and explain various types of regression.
OR
b) Demonstrate representation and working principle of decision tree for classification.
4 a) Explain issues in decision tree learning.
OR
b) Elaborate Maximum a Posteriori Hypothesis( MAP) with an example.
5 a) Explain neural network representation and its types.

b) Explain naive bias classification and write its applications.
6 a) Compare lazy Vs eager learners and Explain k-NN algorithm.
OR
b) Give a detailed note on case based reasoning learning.
7 a) What is well proposed learning problem? Explain attributes with examples.
OR
b) Discuss about minimum learning length principle in detail.
8 a) List out and explain issues to be handled in machine learning algorithm.
OR
b) Explain ID3 algorithm in detail for decision tree learning.

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Mining) VIII-Semester (CBCS) Examination

**Mine Legislation and Safety**

Time: 3 Hours] [Max Marks: 70

Section-A (Marks: 10x1=10)

Answer all questions

1. a) Define RQP
   b) What is meant by prospecting Lease?
   c) Define Adult.
   d) Define ventilation District.
   e) Define Crèche
   f) Define competent authority.
   g) What is meant by occupational health disease?
   h) What is meant by Fatality?
   i) Define workmen.
   j) What is meant by court of enquiry?

Section-B (Marks: 5x12=60)

Answer any **Five** questions

2. a) Explain briefly about various mining legislations in India.

   OR

   b) Why do mine laws needed to be implemented?

3. a) Write about powers and duties of Inspector as per Mines Act.

   OR

   b) What are the duties and responsibilities of Sirdar as per CMR?

4. a) Explain briefly about workmen compensation Act.

   OR

   b) What are the duties and responsibilities of Superintendent as per Rescue rules?

5. a) Explain briefly about the procedure followed in mines after accident.

   OR

   b) i) What are the steps to be taken before certifying occupational disease?
   ii) Explain briefly about duties of certified surgeon.

6. a) Explain briefly about organization layout of HEMM opencast mine.

   OR

   b) Write briefly about safety audits.

7. a) Explain briefly about Mining Committee as per Mines Act

   OR

   b) What are the provisions related to working hours and limitation of employment?

8. a) Explain briefly about various regulations relating to haulage.

   OR

   b) What are the general conditions relating to supply and use of energy?

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**5514/3**

FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech.(Mechanical Engineering) VIII-Semester (CBCS) Examination

Prof. Elective-VI (a)

AUTOMOBILE ENGINEERING

Time: 3 Hours] [Max. Marks: 70

Section – A (Marks: 10x1=10)

Answer all questions

1 a) Enumerate the specifications which should be considered while purchasing an automobile?

b) Why is box section preferred in the design of chassis member to an open channel section?

c) What is the purpose of installing coil spring in a clutch plate?

d) How many universal joints are there in the torque tube transmission and why?

e) What is positive and negative caster?

f) What are beads and why are these provided in a tyre?

g) What is the sprung and unsprung weight?

h) Why brake fading cannot occur in case of disc brakes?

i) What are the different methods available for S.I. engine emission control?

j) How does combustion affect the performance of an engine?

**Section-B (Marks: 5x12=60)**

**Answer any Five** questions

2 a) What are the defects that are normally found in chassis frame? Give example. [12]

OR

b) Describe briefly the following types of frames: [12]
i) conventional frame
ii)semi -integral frame
iii)unit frame

3 a) Explain the construction and working of a centrifugal clutch with the help of neat diagram. [12]

OR

b) Explain clearly the difference between a fluid coupling and a torque convertor. [6]

c) What are the functions of a propeller shaft in the transmission system of a vehicle? [6]

4 a) Explain Ackermann steering mechanism with a neat sketch. [6]

b) Why is an additional gear reduction provided in some automobile? Give an example with a sketch. [6]

OR

Contd..2..

c) With help of neat sketches, explain the various terms involved in steering geometry. [12]

5 a) Discuss the function and working of a Master cylinder assembly in brake system with a sketch [6]

b) Explain the difference between the functioning of coil compression spring and shock absorber. [6]

OR

c) Explain the working of a disc brake system with a neat diagram [12]

6 a) Explain the following Alternative Energy Sources in Automobiles: [12]
i) Natural Gas,
ii) Bio-diesel,
iii) Bio ethanol and
iv) Hydrogen

OR

b) Write the salient features of Eclectic and hybrid vehicles. [6]

c) What are the performance characteristics of SI and IC Engines? [6]

7 a) Mention the different parts of the automobile and discuss their functions briefly. [6]

b) Give the comparison among the sliding mesh, constant mesh and synchromesh gear boxes. [6]

OR

c) Write a note on the following [12]
i) under-inflation and over-inflation.
ii) Macpherson Suspension system

8 a) Explain briefly the elements of a suspension system. [6]

b) State the essential requirements of wheels and tubes in case of automobiles. [6]

OR

c) Discuss about Integral power steering. [6]

d) Explain briefly the various causes of clutch troubles. How can those be remedied? [6]

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**5516/3**

FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Mech Engg) VIII-Semester (CBCS) Examination

Prof. Elective-VI (c)

Industrial Robotics

Time: 3 Hours] [Max. Marks: 70

Section – A (Marks: 10x1=10)

Answer all questions

1. a) What is Partial Automation?
   b) Which is the most common type of robotic end effector?
   c) What is a sensor? Give any two examples' of sensors used in industry.
   d) Define PLC? Mention its basic components.
   e) What is a programmable robot? Give an example.
   f) What is the importance of Human – Machine Interface system?
   g) Write any two characteristics of robots used in spot welding application.
   h) Mention any two examples of robots used in material handling
   i) Define lean manufacturing system
   j) Mention any two tools used for small batch and high change over production

Section – B (Marks: 5x12=60)

Answer any **Five** questions

2. a) Explain the classification of robots by co-ordinate system and control system

   OR

   b) What is the importance of industrial robots in automation Industry? Explain in detail.

3. a) Briefly explain the characteristics of Sensors.

   OR

   b) Discuss the following methods of robotic programming:
      i) Lead through programming ii) walk through programming
      iii) Off-line programming

4. a) Explain the process of preventive maintenance of industrial robots.

   OR

   b) What is robot systems integration, and why is it important in manufacturing?

5. a) Discuss briefly about the robot inspection with an example.

   OR

   b) Describe the necessary features that a robot should have for spray painting?

6. a) Explain the cellular continuous flow manufacturing system with suitable examples.

   OR

   b) Explain the different types of robots used in automated welding process.

7. a) Explain the software packages available for robot programming.

   OR

   b) What features are required for robot in machining processes? Explain.

8. a) Briefly explain the working principle of position sensors with neat sketch.

   OR

   b) Explain the various robotic applications of machine vision.

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FACULTY OF ENGINEERING AND TECHNOLOGY

**B.Tech. (EEE) VIII-Semester (CBCS) Examination**

**Prof. Elective-VI (a)**

**SMART GRID TECHNOLOGIES**

Time: 3 Hours] [Max Marks: 70

**Section – A (Marks: 10x1=10)**

**Answer all questions**

1 a) What is the need of Smart grid?
b) What are the limitations of Smart grid?
c) What is AC Distribution?
d) What are the advantages of DC Power lines?
e) What is Zigbee?
f) What is smart metering?
g) What is microgrid?
h) Why is energy stored?
i) What is stability?
j) What are the advantages of tap-changing Transformer?

**Section – B (Marks: 5x12=60)**

**Answer any five questions**

2 a) Explain the current status of Smart grid in India.
b) What are the Smart grid components? Explain.

(OR)

c) Discuss the comparison of traditional grid and smart grid.
d) Explain the recent advancement of smart grid Technology.

3 a) Write the difference between AC Distribution smart grid and DC Distribution smart grid.

(OR)

b) Explain future neighbourhood potential work and research.

4 a) Explain the typical Architecture of WAMS with the help of neat drawing.

(OR)

b) Write the difference between smart meters and current meters.

5 a) Explain the challenges and advantages of electric vehicles.

(OR)

b) What is the difference between the smart grid and micro grid?
c) What is the need of hybrid micro-grid? Explain advantages of hybrid micro-grid.

6 a) Draw and Explain load frequency control for micro-grid system.

(OR)

b) What is the reactive power control in microgrid system?

7 a) Discuss the international policies in smart grid.

(OR)

b) Explain the new technologies for smart grid.

8 a) Explain in detail Pre and post smart grid communications.

(OR)

b) Explain in detail about communication layer networks.

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**FACULTY OF ENGINEERING AND TECHNOLOGY**

**B.Tech. (CSE &IT) VIII-Semester (CBCS) Examination**

**Pro. Elective-VIII (a)**

**Image Processing**

Time: 3 Hours] [Max. Marks: 70

Section-A (Marks: 10x1=10)

Answer **all** quesitons

1 a) Briefly describe the process of the simple formation model.
b) Illustrate the Fundamental steps in digital image processing.
c) What is the basic concept of spatial filtering? list any two types of spacial filters.
d) Explain the basic principle of frequency domains.
e) Define segmentation, and listout any four applications of it.
f) Briefly explain the Line and Edge Detection.
g) What is the main concept of run-length coding?
h) What are the applications of Huffman Coding?
i) Explain the basic use of skeleton filters in image processing.
j) Explain the Boundary preprocessing.

Section-B (Marks: 5x12=60)

Answer any **Five** quesitons

2 a) Explain (i) image Sampling and (ii) Quantization,with the help of a neat diagram

(OR)

b) Enlist and explain the properties of the Fast Fourier Transform (FFT) applicable to Images.

3 a) Illustrate different steps in the Histogram Processing.

(OR)

b) What is sharpness in an image and explain the sharpening filters in the frequency domain filter?

4 a) Explain the process of Segmentation using Morphological watersheds and list its applications.

(OR)

b) Classify image segmentation and explain different types of Image Segmentation methods.

5 a) Explain The Wiener filtering and mention its advantages and applications.

(OR)

b) Differentiate between Arithmetic Coding and Golomb Coding.

6 a) Explain The Basic steps in Morphological operations like opening and closing.

(OR)

b) Describe about the Region Feature Descriptors.

7 a) Illustrate the image formation model and explain what the devices required to get an image.

(OR)

b) What is smoothing spatial filters? Explain different types of smoothing spatial filters.

8 a) Explain the basic features of the Constrained least squares filter and mention its applications.

(OR)

b) Describe the fundamental operations of the Hit-or-miss transformation.

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (CSE) VIII-Semester (CBCS) Examination

Prof. elective-VIII (b)

Pattern Recognition

Time: 3 Hours] [Max. Marks: 70

**SECTION-A (Marks: 10 x 1 = 10)**

Answer **all** questions

1. a) What are the types of pattern recognition?
   b) Classification Vs Prediction?
   c) How patterns are used in real life?
   d) What are the components of Bayesian decision rule?
   e) What is perceptron?
   f) What is a prior probability?
   g) What do you mean by defuzzification?
   h) What is supervised learning?
   i) What is clustering?
   j) What is min error rate classification?

**SECTION-B (Marks: 5 x 12 = 60)**

Answer any **Five** questions.

2. a) What is classification? Explain characteristics of classifiers.

   OR

   b) Explain how to deal with missing and noisy features in data.

3. a) Provide the formulation and describe all the parameters of univariate and multivariate normal density In Bayesian decision theory.

   OR

   b) Describe the reasons why uniformly distributed training sets do not work with maximum likelihood.

4. a) What is dimensionality reduction? Explain how PCA is used for it.

   OR

   b) Compare Bayesian estimate from maximum likelihood estimation.

5. a) Explain working of Hidden Markov model.

   OR

   b) How the k-nearest neighbor method works? Explain with KNN estimation and KNN rule.

6. a) Explain unsupervised Bayesian learning.

   OR

   b) Explain maximum likelihood estimation with suitable example.

7. a) What is pattern classification? What are major paradigms of machine learning?

   OR

   b) Explain the selection criteria for classifier model.

8. a) Explain components of a typical pattern recognition system with a neat diagram.

   OR

   b) Explain the concept of Gaussian mixture model.

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (IT) VIII-Semester (CBCS) Examination

Prof. Elective-VIII (b)

CLOUD COMPUTING

Time: 3 Hours] [Max. Marks: 70

**Section – A (Marks: 10x1=10)**

Answer **all** questions

1. a) Differentiate cloud computing and Internet.
   b) What are the types of clouds? Specify them.
   c) Define Inter Process Communication.
   d) Define Virtualization.
   e) Specify Different Service Providers?
   f) What is the role of resource scheduler in IaaS service layer?
   g) Specify Different T-Systems.
   h) Write any two technologies used in cloud computing.
   i) Write any two media applications in cloud computing.
   j) Write about different cloud platforms in industry.

**Section – B (Marks: 5x12=60)**

Answer any **Five** questions

2. a) Explain in detail about cloud infrastructure management.

   **(OR)**

   b) Explain different risks and challenges involved in cloud computing.

3 a) Explain pros and cons of virtualization and advantages of virtualization.

   **(OR)**

   b) Explain architectural styles of distributed computing.

4 a) Explain the cloud deployment models in detail and outline the advantages and disadvantages while implementing an application.

   **(OR)**

   b) Design the architecture of PaaS and Saas in cloud computing. Explain the different categories of PaaS and SaaS with suitable example.

5 a) What are the different technologies used for cloud computing? Explain.

   **(OR)**

   b) Describe about implementation of hybrid cloud.

6 a) Explain different health care applications in cloud computing.

   **(OR)**

   b) What is AWS? What types of services does it provides?

7 a) Explain different types of Hardware Virtualization Techniques.

   **(OR)**

   b) What are pros and cons in comparison of public vs hybrid cloud? Explain.

8 a) Explain in detail the cloud security reference model and security risks associated with a cloud.

   **(OR)**

   b) Explain the following.
   i) Digital Signatures ii) Google Cloud Platform

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Mining) VIII-Semester (CBCS) Examination

**Prof. Elective-II (a)**

**Mine Economics**

Time: 3 Hours] [Max Marks: 70

Section – A (Marks: 10x1=10)

Answer **all** questions

1. a) What is National Mineral Policy?
   b) What is Mine Investment?
   c) What is meant by Sampling?
   d) Enlist the Methods of Sampling?
   e) What is meant by Mine Valuation?
   f) Discuss the Net Present Value.
   g) What is meant by Internal Rate of Return (IRR)?
   h) What is meant by mine taxation?
   i) List out the sources of mine funds.
   j) What is Balance sheet?

Section – B (Marks: 5x12=60)

Answer any **Five** questions

2. a) Discuss the National Mineral Policy.

   OR

   b) Discuss the Risk Factors in Mine Investments.

3. a) Discuss the Mine Sampling.

   OR

   b) Explain about the Surface and underground Sampling Methods.

4. a) Write about the assumptions made in the Hoskold's formula.

   OR

   b) Discuss the Income approach for mine Valuation.

5. a) Explain about the methods of project Evaluation.

   OR

   b) Discuss the risks in the mine project financing.

6. a) List out and explain the sources of mine funds.

   OR

   b) Discuss the typical case study of mine feasibility.

7. a) Explain about the Cost approach for mine valuation.

   OR

   b) Describe the classifications of ore reserves.

8. a) Discuss the Market value approach for mine Valuation.

   OR

   b) Explain about the Chip and Grab sampling methods.

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Mining) VIII-Semester (CBCS) Examination

Prof. Elective-III (a)

Rock Fragmentation Engineering

Time: 3 Hours] [Max Marks: 70

Section – A (Marks: 10x1=10)

Answer **all** questions

1 a) Define bit wear
b) What is meant by long hole drilling?
c) Define blastability.
d) What is meant by Exploder?
e) What is meant by incomplete detonation?
f) What is meant by fly rock?
g) Write any one difference between underground and surface blasting.
h) Define Burden.
i) Define detonator.
j) What is geo phone?

Section – B (Marks: 5x12=60)

Answer any **Five** questions

2 a) Explain briefly about various factors that cause wear to drill bits.

(OR)

b) Write briefly about rotary drilling.

3 a) Explain briefly about hydraulic rock hammers and its applicability.

(OR)

b) What is meant by blast efficiency? Explain briefly about it.

4 a) Explain the procedure of dealing with misfired holes.

(OR)

b) Explain briefly about the methods employed to measure ground vibrations.

5 a) Explain briefly about any one controlled blasting technique.

(OR)

b) Write briefly about the mechanism of blasting.

6 a) Write about different types of instruments used in blasting.

(OR)

b) Explain briefly about various precautions to be taken into account while and after blasting.

7 a) Explain briefly about drill performance.

(OR)

b) Write about Slurry and Emulsion explosives.

8 a) Explain briefly about Water deck blast design and mention its merits and demerits.

(OR)

b) Assuming your own conditions design a blast patterns in underground mine.

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FACULTY OF ENGINEERING AND TECHNOLOGY

B.Tech. (Mining) VIII-Semester (CBCS) Examination

Prof. Elective-III (b)

Remote Sensing and Geographical Information System

Time: 3 Hours] [Max. Marks: 70

Section-A (Marks: 10 x 1 = 10)

Answer all questions

1 a) What is remote sensing?
b) Define Reflectance.
c) Write the advantages of active sensors.
d) What is spectral resolution?
e) Explain in brief the need of Digital Image Pre-Processing.
f) Define Image Registration.
g) What are the components of GIS?
h) Write the components of DBMS.
i) Write the role of satellite imagery in urban planning.
j) What is the geometrical method of ore reserve estimation?

Section-B (Marks: 5 x 12 = 60)

Answer any **Five** questions

2 a) Explain Electromagnetic spectrum.

(OR)

b) Explain different types of remote sensing with respect to wavelength regions.

3 a) Define the principle of RADAR and write the factors affecting microwave measurements.

(OR)

b) What are the advantages and disadvantages of various remote sensing platforms?

4 a) Explain in detail the interpretation of images.

(OR)

b) Briefly explain the image contrast enhancement technique.

5 a) Describe different types of Coordinate systems.

(OR)

b) Explain how spatial data and attribute data integrated to make a GIS.

6 a) Explain the role of remote sensing to monitor land cover classification.

(OR)

b) Explain the applications of remote sensing in Mineral Resource Surveys.

7 a) What is a map? Explain the classification of a Map.

(OR)

b) Explain the advantages of RASTER.

8 a) Explain the advantages and limitations of Remote Sensing.

(OR)

b) Explain the role of DGPS Surveys in mining leases and identifying illegalities.

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