F.Y.B.Sc (I.T.) (Sem-II)

July 2018

Con. 313–18. Web Technologies IQ–6947

(3 Hours) [Total Marks : 100

N.B. : (1) **All** questions from question No. 1 to 7 are **compulsory**.
(2) **Figures** tot the **right** indicate marks.

1. Attempt **both** the questions :— 10
   (a) Write notes on Internet, DNS and ISP.
   (b) Explain following tags: <marquee>, <sup>, <pre>,<hr>,<iframe>

2. Attempt any **three** Questions: 15
   (a) Define E commerce. What are the advantages of e commerce ?
   (b) Describe the three components of email.
   (c) What is a web browser? List and compare different available web browsers.
   (d) Define E business. List a few applications of e business.

3. Attempt any **three** Questions: 15
   (a) How to place hyperlink on web page? Explain <A> tag in detail.
   (b) What are Stylesheets? Explain different approaches of stylesheet.
   (c) What are event handlers? Explain five event handlers.
   (d) Write code for the following output using list tags:
      1. F.Y.B.Sc.(IT)
         i. New Syllabus
         ii. New Question format
      2. S.Y.B.Sc.(IT)
         i. Old Syllabus
         ii. Old Question format

4. Attempt any **three** Questions: 15
   (a) Explain the difference between client side and server side javascript.
   (b) What is an array? How is it used in javascript?
   (c) Write a program in javascript to find greatest of three given numbers
   (d) write a javascript to print all prime numbers from 1 to 100.

[TURN OVER

5. Attempt any **three** Questions: 15

(a) What is XML? How it is different from HTML?

(b) What is XSL? Why we need it.

(c) Explain CDATA. Also explain how whitespaces are handled in XML.

(d) Explain Schema element structure in XML

6. Attempt any **three** Questions: 15

(a) What is PHP? Explain the features of PHP.

(b) Write notes on variables in PHP

(c) What is MySQL? Give its salient features.

(d) Explain array in Php.

7. Attempt any **three** Questions: 15

(a) Explain different operators in php.

(b) Write a notes on Cookies in PHP.

(c) Write a note on type conversion in PHP. Give Example

(d) Explain the string operators in PHP with examples.

Con. 313–18. IQ–6947

(3 Hours) [Total Marks : 80

N.B. : (1) **Each** Question carries **05** Marks.
(2) **All** Questions are **compulsory**.

1. Attempt any **two** questions (5 marks each) :- **10**
   (a) Define E commerce. What are the advantages of e commerce?
   (b) Describe the three components of email.
   (c) What is a web browser? list and compare different available web browsers

2. Attempt any **two** questions (5 marks each) :- **10**
   (a) How to place hyperlink on web page? Explain <A> tag in detail.
   (b) What are Stylesheets? Explain different approaches of stylesheet.
   (c) What are event handlers? Explain five event handlers.

3. Attempt any **two** questions (5 marks each) :- **10**
   (a) Explain the difference between client side and server side javascript.
   (b) What is an array? How is it used in javascript?
   (c) Write a program in javascript to find greatest of three given numbers

4. Attempt any **two** questions (5 marks each) :- **10**
   (a) Define E business. List a few applications of e business.
   (b) Write code for the following output using list tags:
      1. F.Y.B.Sc.(IT)
         i. New Syllabus
         ii. New Question format
      2. S.Y.B.Sc.(IT)
         i. Old Syllabus
         ii. Old Question format
   (c) write a javascript to print all prime numbers from 1 to 100.

[TURN OVER

5. Attempt any **two** questions (5 marks each) :- **10**
   (a) What is XML? How it is different from HTML?
   (b) What is XSL? Why we need it?
   (c) Explain CDATA. Also explain how whitespaces are handled in XML

6. Attempt any **two** questions (5 marks each) :- **10**
   (a) What is PHP? Explain the features of PHP.
   (b) Write notes on variables in PHP.
   (c) What is MySQL? Give its salient features.

7. Attempt any **two** questions (5 marks each) :- **10**
   (a) Explain different operators in php.
   (b) Write a note on Cookies in PHP.
   (c) Write a note on type conversion in PHP. Give Example

8. Attempt any **two** questions (5 marks each) :- **10**
   (a) Explain Schema element structure in XML.
   (b) Explain array in Php.
   (c) Explain the string operators in PHP with examples.

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(4)

F.Y.B.Sc (I.T.) (Sem-II)

3414
2018

Con. 314-18. Applied Mathematics – (II) **IQ-6765**

(3 hours) Total Marks: 100

N.B. : (1) All questions are compulsory.

(2) Figures to the right indicate full marks for each question.

Q.1 Attempt any one of the following:-

a) Using D.U.I.S rule prove that $\int_0^{\infty} \frac{\tan^{-1}(ax)}{x(1+x^2)} dx = \frac{\pi}{2}\log(1+a)$. 10

b) Show that the transformation $w = \frac{1}{z}$ transforms circle $|z-3| = 5$ into the circle

$\left|w + \frac{3}{16}\right| = \frac{5}{16}$. 10

Q.2 Attempt any three of the following:-

a) Using De'Moivre's Theorem prove $\cos 4\theta = \cos^4\theta - 6\cos^2\theta\sin^2\theta + \sin^4\theta$. 05

b) Find the square roots of the 7 + 24i. 05

c) Show that $\left(1+i\sqrt{3}\right)^8 + \left(1-i\sqrt{3}\right)^8 = -2^8$. 05

d) Show that $\cosh^{-1} x = \log\left(x + \sqrt{x^2-1}\right)$. 05

Q.3 Attempt any three of the following:-

a) Estimate $\int_{1+i}^{4+2i} (x-2y+iy)dz$ along the parabola $y^2 = x$. 05

b) Show that $f(z) = Z + 2\bar{Z}$ is not analytic function. 05

c)Evaluate the integral by using Residue theorem:

$\oint_C \frac{1-2z}{z(z-1)(z-2)} dz$ where C: $|Z| = 1.5$. 05

d) Find the image of the square whose vertices are 1, 1+i, i, and 0 under the translation

$T(z) = z + 1 + i$. 05

[TURN OVER

Q.4 Attempt any three of the following:-

a) Evaluate $\int_0^1 \int_0^x (x^2 + y^2)dydx$ by changing to polar coordinates. 05

b) Find the volume of the solid S in the first octant common to the cylinders $x^2 + y^2 = 9$ and $x^2 + z^2 = 9$. 05

c) Evaluate $\int_0^1 \int_{x^2}^x (x^2 + 2xy + y^2)dxdy$. 05

d) Evaluate $\int_0^{2\pi} \int_0^2 \int_0^{4-r^2} rdzdrd\theta$. 05

Q.5 Attempt any three of the following:-

a) Evaluate $\int_0^\infty \frac{x^7}{7^x}dx$. 05

b) Prove that $\int_0^{\pi/2} \sqrt{\tan\theta} = \frac{\pi}{\sqrt{2}}$. 05

c) Evaluate $\int_0^1 (x\log x)^4 dx$. 05

d) Show that $\int_0^2 x\left(8 - x^3\right)^{\frac{1}{3}} dx = \frac{16\pi}{9\sqrt{3}}$. 05

Q.6 Attempt any three of the following:-

a) Find the Fourier Transform of $F\{t\} = \begin{cases} t \text{ for } |t| < a \\ 0 \text{ for } |t| > a \end{cases}$. 05

b) Find the Fourier series of the function $f(x) = x\sin x$ in the interval $0 \le x \le 2\pi$. 05

c) Find Fourier cosine transform of $F(t)=\frac{\sin as}{s}$. 05

d) Express f(x) = x as a half-range sine series in (0, 2). 05

Q.7 Attempt any three of the following:-

a) Find the Laplace transform of cost cos2t cos3t. 05

b) Find the Laplace transform: $\int_0^\infty \frac{e^{-t}(\cos 3t-\cos 2t)}{t}dt$. 05

c) Find the inverse Laplace transform: $\frac{s}{(s^2+1)(s^2+4)}$. 05

d) Find inverse Laplace transform of $\log\left(\frac{s^2+1}{s(s+1)}\right)$. 05

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(3 hours) Total Marks: 80

N.B. : (1) All questions are compulsory.

(2) Figures to the right indicate full marks for each question.

Q.1 Attempt any two of the following:-

b)Show that $(2+i)^4+(2-i)^4=50\cos 4\theta$. 05

c)Prove that $\sinh^{-1}x=\log\left(x+\sqrt{x^2+1}\right)$. 05

d)Show that $\sin 7\theta=7\sin\theta-56\sin^3\theta+112\sin^5\theta-64\sin^2\theta$. 05

Q.2 Attempt any two of the following:-

a) Determine whether $f(Z)=sinZ$ is analytic and find $f'(Z)$. 05

b) Evaluate $\int_C f(z)dz$, from z = 0 to z = 2i, where f(z)= $\bar{z}$. 05

c) Find the residues of the function $f(z)=\frac{z^2}{(z-1)^2(z+2)}$ at their respective poles. 05

Q.3 Attempt any two of the following:-

a)Evaluate the area of the region R which is bounded by the parabolas $y^2=9-3x$ and $y^2=9-x$. 05

b)Find the volume of the solid S which is bounded below by the paraboloid $z=x^2+y^2$ and above by the plane $z=2y$. 05

c)Evaluate $I=\int_0^1\int_{-\sqrt{x-x^2}}^{\sqrt{x-x^2}}(x^2+y^2)dydx$. 05

Q.4 Attempt any two of the following:-

a) Express complex number $\frac{4+i\sqrt{2}}{3-i\sqrt{2}} + \frac{2+i\sqrt{2}}{3+i\sqrt{2}}$ into the standard form of complex number. 05

b) Find the image of the line $x + y + 1 = 0$ under the inversion map $W = \frac{1}{z}$. 05

c) Evaluate $I = \int_0^{2\pi}\int_0^{4}\int_0^{a} r^2 \cos\theta \, dr \, d\theta \, d\phi$. 05

Q.5 Attempt any two of the following:-

a) Evaluate $\int_0^{\infty} \sqrt{x} e^{-3\sqrt{x}} dx$. 05

b) Evaluate $\int_0^{1} x^3 \left[\log\left(\frac{1}{x}\right)\right]^4 dx$. 05

c) Evaluate $\int_3^{7} (x-3)^{\frac{1}{4}} (7-x)^{\frac{1}{4}} dx$. 05

Q.6 Attempt any two of the following:-

a) Find the Laplace transform $e^t + \sin 2t . \sin 3t$ 05

b) Evaluate $\int_0^{\infty} e^{-2t} t^2 \sin 3t$ using Laplace transforms. 05

c) Find inverse Laplace transform of $\frac{s^2+10s+13}{(s-1)(s^2-5s+6)}$. 05

Q.7 Attempt any two of the following:-

a) Find the Fourier transform of $f(t) = e^{-|t|}$. 05

b) Obtain the Fourier expansion of e^x in $-\pi < x < \pi$. 05

c) Find Fourier cosine and sine transform of $F(t) = 2e^{-5t} + 5e^{-2t}$. 05

[TURN OVER

Q.8 Attempt any two of the following:-

a) Find inverse Laplace transform of $\log\left(\frac{s+1}{(s+2)(s+3)}\right)$. 05

b)Using D.U.I.S. rule, prove that $\int_0^\infty e^{-ax}\left(\frac{sinx}{x}\right)dx = \frac{\pi}{2} - tan^{-1}a.$ 05

c) Express f(x) = x as a half-range cosine series in $0 < x < 2$. 05

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(10)

F.Y. B.Sc (I.T.) (Sem-II)

July 2018

Con. 315–18. Microprocessor and Microcontrollers IQ–6532

(3 Hours) [Total Marks : 80

N.B. : (1) **Each** Questions carries **05** marks.

(2) Attempt any **two** questions.

1. Answer the following (any **two**) :—
   (a) Explain different types of encoder. 5
   (b) Explain the working of D flip-flop with its circuit diagram. 5
   (c) Explain the different types of memory in short. 5

2. Answer the following (any **two**) :—
   (a) Explain the organization of microprocessor based system with diagram. 5
   (b) Draw the pin diagram of 8085 microprocessor and explain in short. 5
   (c) Explain memory mapped I/o with diagram. 5

3. Answer the following (any **two**) :—
   (a) What is an instruction ? Explain with its 5 types of categories. 5
   (b) Explain one byte, two byte and three byte instruction with one e.g. 5
   (c) Write a 8085 program to add two 16 bit data. 5

4. Answer the following (any **two**) :—
   (a) Explain tri-state devices and buffer. 5
   (b) Write a short note on address decoding techniques. 5
   (c) Explain 8085 addressing modes with examples. 5

5. Answer the following (any **two**) :—
   (a) Explain PCI Bus with its features. 5
   (b) Explain Cache mapping with its different methods. 5
   (c) Explain the different types of system bus. 5

[TURN OVER

6. Answer the following (any **two**) :—

(a) Explain Architecture of Intel 8051 microcontroller with diagram. **5**

(b) Explain different modes of operation of timer. **5**

(c) Explain the following instructions :— **5**

(i) ADD a, Rr (ii) CLR A (iii) DEC A (iv) MUL AB (v) CPL A

7. Answer the following (any **two**) :—

(a) Explain serial communication in 8051. **5**

(b) List and explain various assembler directives of the 8051. **5**

(c) Explain bit and byte jump instructions. **5**

8. Answer the following (any **two**) :—

(a) Write a short on external memory. **5**

(b) What is RAID ? Explain with its characteristics. **5**

(c) Explain port 2 & 3 in 8085 microcontroller. **5**

(3 Hours) [Total Marks : 100

N.B. : All questions are **compulsory.**

1. Attempt the following questions :—
   (a) Explain RAM Vs ROM. 5
   (b) Describe chip select logic using gates with suitable e.g. 5

2. Answer the following (any **three**) :—
   (a) Explain Architecture of Intel 8085 with diagram. 5
   (b) Draw net label pin out diagram of 8085. 5
   (c) Differentiate between Memory Mapped I/O and I/O Mapped I/O. 5
   (d) Write a short note on latch and buffer. 5

3. Answer the following (any **three**) :—
   (a) Explain Addressing Modes of 8085. 5
   (b) Explain three groups of Instruction Formats with e.g. 5
   (c) Explain the following instructions :— 5
   (i) MOV, (ii) LXI, (iii) SUB, (iv) STA, (v) RLC.
   (d) Write a short note on hardware interrupts of microprocessor 8085. 5

4. Answer the following (any **three**) :—
   (a) Explain the Basic Computer Operations with diagram. 5
   (b) Write a short note on Cache Memory. 5
   (c) Explain the different types of system bus. 5
   (d) Explain Data transfer operations with the help of examples. 5

5. Answer the following (any **three**) :—
   (a) Draw Diagram pin out 8051. Explain briefly. 5
   (b) Write a 8051 program to display addition to two binary numbers. 5
   (c) Explain delay loop used in 8051 programs. 5
   (d) Define PCI bus with its features. 5

[TURN OVER

6. Answer the following (any **three**) :—

(a) Explain SFRs of microcontroller 8051. 5

(b) Explain 8051 Architecture in brief with diagram. 5

(c) Write a 8051 program to display toggle 00H and FFH. 5

(d) What is RAID ? Explain with its characteristics. 5

7. Answer the following (any **three**) :—

(a) Explain port 1 in 8085 microcontorller. 5

(b) List and explain various assembler directives of the 8051. 5

(c) Explain serial communication in 8051. 5

(d) Explain the following instructions :— 5

(i) JNC label (ii) RRC (iii) SETB C (iv) INC A (v) PUSH direct.

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(14)

F.Y.B.Sc (I.T.) (Sem. II)

July 2018

Con. 316-18. Database Management Systems IQ-6394

(3 Hours) [Total Marks : 80

N.B. : (1) **All** questions are **compulsory.**
(2) Draw **neat** and **labelled** diagram wherever **necessary.**
(3) Write answer to a **new** question on a **fresh** page.
(4) **Figures** to the **right** indicates **full** marks.

1. Answer any **two** out of **three** :— **10**
   (a) What is the purpose of using DBMS ?
   (b) List and explain the different types of database users.
   (c) Write a short note on transaction management.

2. Answer any **two** out of **three** :— **10**
   (a) Explain the different levels of data abstraction.
   (b) Explain the different types of relationships with examples.
   (c) Explain the merits and demerits of hierarchical data model.

3. Answer any **two** out of **three** :— **10**
   (a) Write a short note on normalization.
   (b) Explain the terms generalization, specialization and aggregation.
   (c) Explain the different types of mapping constraints.

4. Answer any **two** out of **three** :— **10**
   (a) What are the advantages of relational database systems ?
   (b) Write a short note on entity relationship data model.
   (c) List and explain the different types of relational database keys.

5. Answer any **two** out of **three** :— **10**
   (a) Write a short note on relational calculus.
   (b) What is query language ? Explain relational algebra.
   (c) Explain the extended relational algebra operators with example.

[TURN OVER

6. Answer any **two** out of **three** :— **10**

   (a) Define view. Differentiate between tables and views.

   (b) Explain aggregate functions with examples.

   (c) Explain Primary Key and Foreign Key constraints.

7. Answer any **two** out of **three** :— **10**

   (a) Explain the properties of transactions.

   (b) What is concurrency control ? Why is is needed ?

   (c) What are the disadvantages of using lock-based protocols ?

8. Answer any **two** out of **three** :— **10**

   (a) Distinguish between relational algebra and relational calculus.

   (b) List and explain the different types of joins with examples.

   (c) Which states does a transaction pass through during its life time ?

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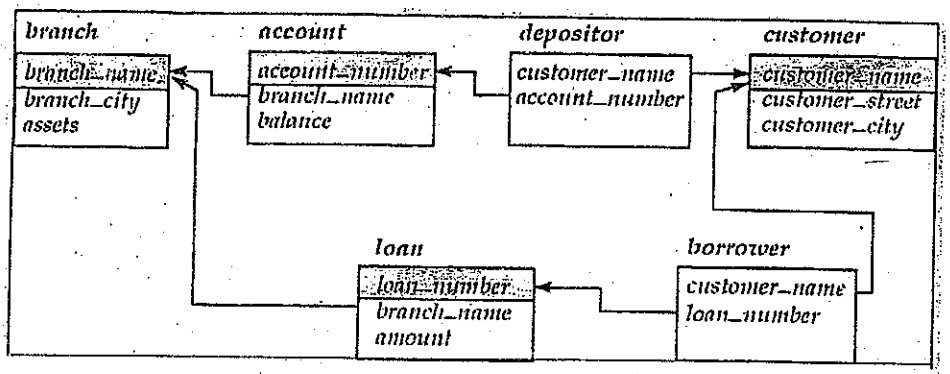
(16)

(3 Hours) [Total Marks : 100

N.B. : (1) **All** questions are **compulsory.**
(2) Draw **neat** and **labelled** diagram wherever **necessary.**
(3) Write answer to a **new** question on a **fresh** page.
(4) **Figures** to the **right** indicates **full** marks.

1. Given below is the banking scheme. 10



(a) Solve the queries below using relational algebra.
(i) Find the names of all customers who have a loan at the Kurla branch.
(ii) Find the names of all customers who have a loan at the Dadar Branch but do not have an account at any branch of the bank.
(iii) Find the names of all customers who have a loan at the Colaba branch.
(iv) Find the names of all customers who have a loan and an account at bank.
(v) Find all customers who have an account at all branches located in Pune.

(b) Solve the queries below using SQL.
(i) Find the names of all branches in the loan relations, and remove duplicates.
(ii) Find the names and loan amount of all customers having a loan at the Pune brach.
(iii) Find the names of all customers whose street includes the substring "main".
(iv) List in alphabetic order the names of all customers having a loan in Andheri branch.
(v) Find all customers who have both an account and a loan at the bank.

[TURN OVER

(17)

2. Answer any **three** out of **four** :— 15
   (a) Define database administrator ? Explain his/her functions.
   (b) Write a short note on database architecture.
   (c) What are the problems associated with file systems ?
   (d) What are the advantages of relational database systems ?

3. Answer any **three** out of **four** :— 15
   (a) Explain the merits and demerits of network database model.
   (b) Explain the different levels of data abstraction.
   (c) What are the advantages and disadvantages of hierachical data model ?
   (d) Write a short note on business rules.

4. Answer any **three** out of **four** :— 15
   (a) Explain the ER desing issues.
   (b) What is UML ? Explain any three types of UML diagrams ?
   (c) List and explain the different types of relational database keys ?
   (d) What is a relational table ? What are the characteristics of a relational table ?

5. Answer any **three** out of **four** :— 15
   (a) Explain the various types of joins in relational algebra ?
   (b) Explain the basic relational algebra operators with example ?
   (c) Write a short note on relational calculus.
   (d) Distinguish between relational algebra and relational calculus.

6. Answer any **three** out of **four** :— 15
   (a) Define constraints. Explain the types of constraints with examples.
   (b) Mention the different categories of data integrity ?
   (c) List and explain the basic domain types of SQL.
   (d) List and explain the different types of joins with examples.

7. Answer any **three** out of **four** :— 15
   (a) What is a transaction ? Explain the lifecycle of a transaction.
   (b) State and explain the ACID properties of transactions ?
   (c) What are the disadvantages of using lock-based protocols ?
   (d) Write a short note on time-stamp based protocol.

F.Y.B.Sc (I.T.) (Sem-II)

July 2018

Data Communication and Networking

Con. 317–18. IQ–6148

(3 Hours) [Total Marks : 100

N.B. : (1) **All** questions from question No.1 to 7 are **compulsory**.
(2) Figures to **right** indicate the marks.

1. Attempt **both** the questions:- 15
   (a) What is data flow? Explain Simplex, Half Duplex and Full Duplex mode of communication.
   (b) Write notes on LAN, MAN and WAN.

2. Attempt any **three** (5 marks each) :- 15
   (a) What are the characteristics and components of data communication?
   (b) Explain Composite analog signals.
   (c) Explain the concept of protocols.
   (d) Explain the term bandwidth of a signal and bandwidth of a channel.

3. Attempt any **three** (5 marks each) :- 15
   (a) What is the OSI model? List its layers and explain their responsibility.
   (b) Explain the structure of TCP I/P protocol.
   (c) What is NAT ? Why is it used for ?
   (d) Differentiate between the working of Data link layer, Network layer and Transport layer.

4. Attempt any **three** (5 marks each) :- 15
   (a) What is Error? Explain the classification and categories of Error.
   (b) Explain CRC with example.
   (c) Write a short note on Checksum?
   (d) What is sampling and explain its importance.

[TURN OVER

5. Attempt any **three** (5 marks each) :- 15

   (a) What are the different ways of converting analog data to digital data?

   (b) What is modulation? What are its two types?

   (c) What is data transmission? What are the different possible ways of transmitting data?

   (d) Write short note on transmission medium and explain its different types.

6. Attempt any **three** (5 marks each) :- 15

   (a) What is a Topology? What are the Basic Types of Topology?

   (b) Write note on Routing Algorithm.

   (c) Explain Packet Switching in brief.

   (d) Explain Time Division Switching

7. Attempt any **three** (5 marks each) :- 15

   (a) What is IPv6 ? Why we need IPv6 Addressing.

   (b) Explain DHCP using IP6.

   (c) Describe the different types of IPv4 and IPv6 nodes.

   (d) Explain IPv6 Auto-Configuration and its types.

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(20)

(3 Hours) [Total Marks : 80

N.B. : (1) **Each** Question carries **05** Marks.
(2) **All** Questions are **compulsory**.

1. Attempt any **two** questions (5 marks each) :- **10**
   (a) What are the characteristics and components of data communication?
   (b) Explain Composite analog signals.
   (c) Explain the concept of protocols.

2. Attempt any **two** questions (5 marks each) :- **10**
   (a) What is the OSI model? List its layers and explain their responsibility.
   (b) Explain the structure of TCP/IP protocol.
   (c) What is NAT? Why is it used for?

3. Attempt any **two** questions (5 marks each) :- **10**
   (a) What is Error? Explain the classification and categories of Error.
   (b) Explain CRC with example.
   (c) Write a short note on Checksum.

4. Attempt any **two** questions (5 marks each) :- **10**
   (a) Explain the term bandwidth of a signal and bandwidth of a channel.
   (b) Differentiate between the working of Data link layer, Network layer and Transport layer.
   (c) What is sampling and explain its importance.

5. Attempt any **two** questions (5 marks each) :- **10**
   (a) What are the different ways of converting analog data to digital data ?
   (b) What is modulation? What are its two types ?
   (c) What is data transmission? What are the different possible ways of transmitting data ?

[TURN OVER

(27)

6. Attempt any **two** questions (5 marks each) :- **10**

   (a) What is a Topology? What are the Basic Types of Topology?

   (b) Write note on Routing Algorithm.

   (c) Explain Packet Switching in brief.

7. Attempt any **two** questions (5 marks each) :- **10**

   (a) What is IPv6? Why we need IPv6 Addressing.

   (b) Explain DHCP using IP6.

   (c) Describe the different types of IPv4 and IPv6 nodes.

8. Attempt any **two** questions (5 marks each) :- **10**

   (a) Write short note on transmission medium and explain its different types.

   (b) Explain Time Division Switching

   (c) Explain IPv6Auto-Configuration and its types.

S.Y.B.Sc(I.T.)
(Sem-II)

Page-22