

PURBANCHAL UNIVERSITY

2022

B.E. (Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG375CO: Computer Network (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

8×10=80

- 1.(a) Explain TCIP model.
- 1.(b) Write in brief about basic computer networking hardware.
- 2(a) Compare between twist pair and optical fiber based communication.
- 2(b) Explain in brief about circuit switched network.
- 3(a) Generate CRC for $M(x) = x^{10} + x^8 + x^5 + x^4 + x$ and
 $G(x) = x^3 + x^2 + 1$
- 3(b) Generate Hamming code for (1011101)₂.
- 4(a) Explain ALOHA and slotted ALOHA technique.
- 4(b) Write in brief about link state routing.
- 5(a) Explain about token bucket algorithm.
- 5(b) Write in brief about Go back N.
- 6(a) Describe about the operation of UDP.
- 6(b) Explain about a basic communication model.
- 7(a) Compare between classfull and classless IPV4 address.
- 7(b) Subnet the following Class C IP 200.200.200.0 equally within four departments.
- 8(a) Explain about the operation and use of router.
- 8(b) Explain about the services of application layer using example.

Contd. ...

(a) What is digital signature? Explain.

(b) Write in brief about ICMP

10. Write short note on any FOUR:

(a) Firewall

(b) P2P network

(c) Sockets

(d) MODEM

(e) Advantages of computer network

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- 8(a) Explain about the operation and use of router.
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(2)

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(a) Firewall

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(e) Advantages of computer network



PURBANCHAL UNIVERSITY

2021

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BEG375CO: Computer Network (New Course)

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8×10=80

- 1(a) What is computer network? Write the history of the computer network. 5
- (b) Differentiate between connection oriented and connectionless services in computer network. 5
- 2(a) Why do we use CSMA-CA instead of CSMA-CD? 5
- (b) Differentiate between twisted pair, coaxial cable and optical fiber of guided media. 5
3. What is RAID technology? Discuss the different levels of RAID in brief. 3+7
- 4(a) List the IEEE standard 802 for LANs. Explain any three. 5
- (b) Which layer of X.25 is called packet layer protocol? Explain virtual circuit of X.25. 5
5. What is congestion control in computer network? Differentiate between leaky bucket and token bucket algorithm. 4+6
6. Why error detection and correction is required in computer network? Explain how Checksum can be used for error detection with suitable example. 3+7
7. How TCP/IP differ from OSI model. Explain each layer of OSI in detail. 3+7
8. What is cryptography? Explain different types of cryptography with example. 2+8
9. Write short note on any TWO: 2×5=10
- (a) TCP format
(c) Network workstation
- (b) Protocol Standards
(d) Firewall



PURBANCHAL UNIVERSITY
2019

B.E. (Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG375CO: Computer Network (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

8×10=80

- 1(a) Mention the important benefits of computer networks. 5
- (b) Differentiate between connection oriented and connectionless services in computer network. 5
- 2(a) Why do we use CSMA-CA instead of CSMA-CD? 5
- (b) Differentiate between twisted pair, coaxial cable and optical fiber of guided media. 5
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7. How TCP/IP differ from OSI model? Explain each layer in detail. 3+7
8. What is cryptography? Explain the concept of digital signature. 2+8
9. Write short note on anyFOUR. 4×2.5=10
- (a) TCP format
(b) Protocol Standards
(c) Network workstation
(d) APRET
(e) Firewall

PURBANCHAL UNIVERSITY

2018

B.E. (Computer) / Sixth Semester / Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG375CO: Computer Network (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

- 1(a) Mention the important benefits of computer networks. 5
- (b) Briefly explain each layer of OSI model. 5
- 2(a) Briefly explain with suitable example of CSMA/CD protocol. 5
- (b) Explain RAID in detail. 5
- 3(a) What are the three major classes of guided media? Briefly explain them. 5
- (b) Describe and distinguish between FDMA and TDMA. 5
- 4(a) What is an Ethernet address? Explain IEEE802.3 and the Ethernet. 1+4
- (b) What are the drawbacks in 802.3 which are overcome in 802.4? 5
5. Explain leaky-bucket and token bucket algorithms. 5+5
- 6(a) Briefly explain TCP/IP protocol architecture. 5
- (b) Differentiate between IPv4 and IPv6. 5
7. What is non-adaptive routing algorithm? Explain various types of adaptive routing algorithms? 2+8
- 8(a) What is protocol? Classify IP address on the basis of classes and version. 5
- (b) What is ICMP protocol? Explain types of error generated by ICMP. 1+4
9. Write short note on any TWO. 2×5=10
(a) Domain model (b) Bridge (c) Aloha

PURBANCHAL UNIVERSITY

2017

B.E. (Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG375CO: Computer Network (New Course)

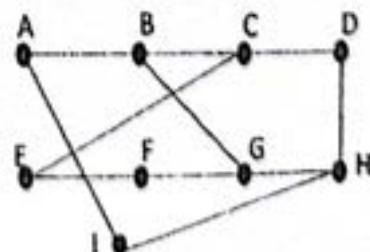
Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

- 1(a) Define computer network. Discuss any four application of computer network. 5
- (b) What is network topology? Explain different types of network topology. 5
- 2(a) What is transmission media? What are different types of media? Explain. 5
- (b) Describe how CSMA/CD works. 5
- 3(a) What is Multiplexing? Describe time division and frequency division multiplexing techniques. 5
- (b) What do you mean by packet switching? 5
- 4(a) A bit word 1011 is to be transmitted. Construct the even parity seven-bit Hamming code for this data. 5
- (b) Explain go back N sliding window protocol. 5
- 5(a) Explain link state routing algorithm. 5
- (b) For the given network construct a new routing table for node I using distance vector routing algorithm on the basis of given information. 5

From\To	A	B	C	D	E	F	G	H	I	
A	0	10	24	38	12	24	16	19	9	IA Delay = 8
H	20	31	19	8	30	19	6	0	7	IH delay = 12



- 6(a) What do you mean by congestion in network? How congestion occurs in network? 5

Contd. ...

(2)

- (b) Differentiate between Leaky bucket and Token bucket algorithm.
- 7(a) Give the overview of TCP/IP. How it differs from OSI reference architecture?
- (b) Draw a packet format for UDP. Describe each field in brief.
- 8(a) A company is granted a site address 201.70.64.0. The company needs six subnets. Design the subnets.
- (b) What is firewall? Describe the basic components of firewall.
9. Write short note on any TWO. 2×5
- (a) Connection oriented and connection less service
 - (b) FDDI
 - (c) OSI reference architecture.
 - (d) Router and Bridge



PURBANCHAL UNIVERSITY

2016

B.E. (Computer) / Sixth Semester / Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG375CO: Computer Network (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

- 1(a) Differentiate between OSI reference model and TCP/IP model. 4
(b) Differentiate between TCP and UDP protocol. 1+5
- 2(a) Briefly explain about hub, switch and router in terms of collision domain and broadcast domain. 1+4
(b) Explain with suitable example about multicast, unicast and broadcast addressing. 5
- 3(a) Explain briefly about different kinds of transmission media used in computer networks. 4
(b) Describe and distinguish between FDMA and TDMA. 2+4
- 4(a) Briefly explain about IEEE 802.4 frame format. 2+2
(b) List out different types of error detection and correction techniques. How Hamming code is different from CRC? 2+2+2
- 5(a) Explain leaky bucket algorithm and compare it with token bucket algorithm. 4
(b) What are the routing algorithms? Briefly explain about distance vector and link state routing algorithms with suitable example. 2+4
6. Briefly explain application layer protocols HTTP, SMTP, POP and IMAP. 10

Contd. ...

(2)

- 7(a) What is sub-netting? Why is it so important in IP addressing?
Briefly explain different types of classes of IP addresses with their
network and host addresses. 1+2
- (b) What is the importance of IPv6 over IPv4?
- 8(a) Discuss jitter control.
- (b) Discuss importance of gateways and bridges.
9. Write short note on any TWO.
- (a) Symmetric cryptography (DES, AES)
(b) ICMP
(c) Substitution Cipher



PURBANCHAL UNIVERSITY

2022

B.E. (Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG377CO: Theory of Computation (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

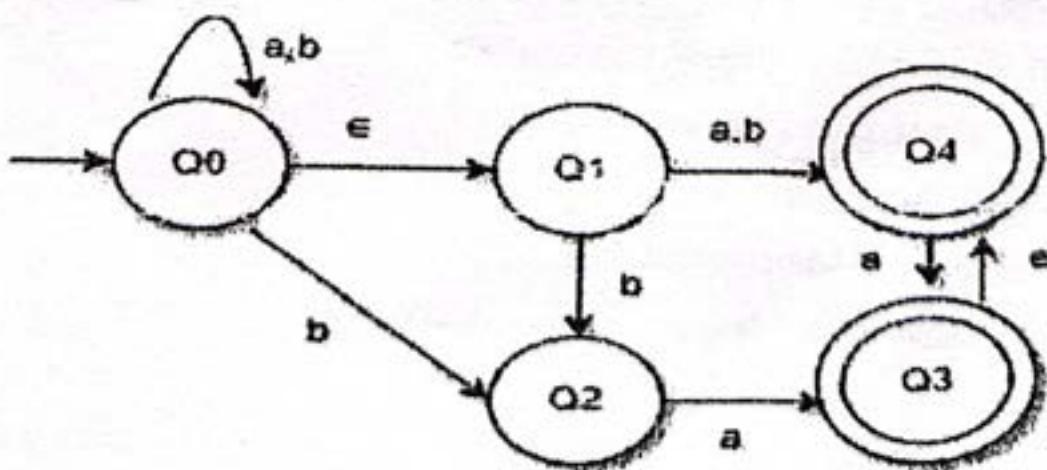
- 1(a) Prove that $n^3 - dn$ is divisible by 3 using mathematical induction technique. 6
- (b) Design a DFA that accepts strings of even length over the alphabet $\Sigma = \{a, b\}^*$. 4
- 2(a) Minimize the following DFA using state minimization method. 4

δ / Σ	0	1
$\rightarrow Q_0$	Q_1	Q_2
$*Q_1$	Q_1	Q_3
$*Q_2$	Q_2	Q_2
$*Q_3$	Q_5	Q_2
$*Q_4$	Q_4	Q_2
$*Q_5$	Q_4	Q_2
$*Q_6$	Q_5	Q_6
$*Q_7$	Q_5	Q_6

Note: \rightarrow for start state, * for final state

- (b) Construct a DFA equivalent to NFA as shown:

6



Contd. ...

3. State and prove the pumping lemma for regular sets/languages.
Prove that the language $L=\{w=a^n b^n / n \geq 1\}$ is not regular. 6+4
- 4(a) What is ambiguous grammar? Show that given grammar is ambiguous: 4
- $S \rightarrow aB|ab$
 $A \rightarrow aAB|a$
 $B \rightarrow ABb|b$
- (b) What is CNF? Convert following CFG into CNF, $G=(V, \Sigma R, S)$ where 6
- $V = \{S, A, B\},$
 $\Sigma = \{a, b\},$
 $R = \{S \rightarrow aAB|AaB|B, A \rightarrow aA|\epsilon, B \rightarrow ab|bA\}$
5. How is PDA superior to a DFA? What are the moves of a PDA?
Design a PDA for the language $L=\{WCW^R / WE(a,b)^*\}$ and W^R is the reverse of $w\}$ 2+3+5
- 6(a) Define Turing Machine. Design a Turing machine that accepts the language $L= a^n b^n c^n / n \geq 0$. 5
- (b) How can you represent a Turing Machine? Show that the function, $f(n)=X+1$, is Turing Computable. 5
- 7(a) How does computability differ from complexity theory? Describe about the time and space complexity. 5
- (b) What is P, NP AND NP-Complete problems? Explain with examples. 5
- 8(a) "For every CFG there is an equivalent push down Automata". Justify this statement with an example. 5
- (b) Explain decision properties of CFL. 5
9. Write short notes on any TWO: 2×5=10
- (a) Church Turing Thesis
(b) Closure Properties of CFL
(c) Halting Problem (d) Arden's Theory



PURBANCHAL UNIVERSITY

2021

B.E. (Computer)/Sixth Semester/Final

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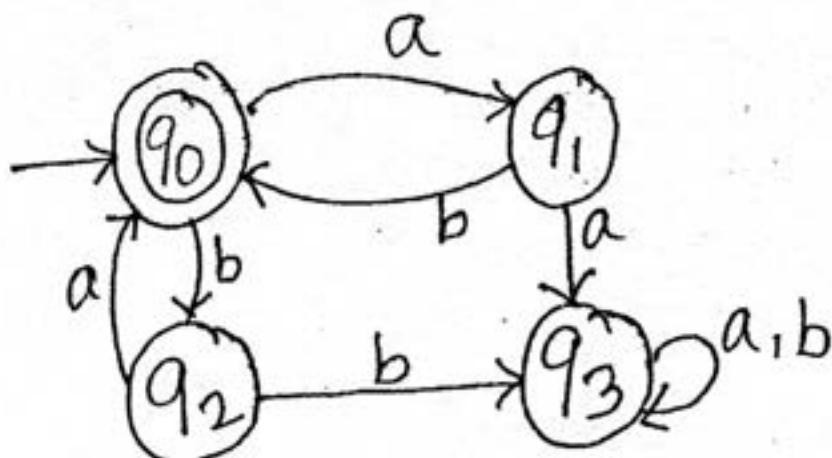
BEG377CO: Theory of Computation (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

- 1(a) Prove that $n^4 - 4n^2$ is divisible by 3 using mathematical Induction technique. 5
- (b) Differentiate between DFA and NFA. 5
2. State Arden's theorem. Use this theorem to find the equivalent RE regular expression of the following DFA. 3+7



- 3(a) State pumping lemma for CFL. Discuss decision algorithms for CFL. 2+6
- (b) Differentiate between DPDA and NDPDA. 2
- 4(a) Using the pumping lemma for regular sets prove that the language $L = \{a^n b^m \mid n \leq m\}$ is not regular. 4
- (b) Show that regular languages are closed under union and intersection. 6
5. Convert the following CFG into CNF: 5

$$S \rightarrow aB|bA \quad A \rightarrow bAA|aS|a \quad B \rightarrow aBB|bS|b .$$

Contd. ...

(2)

- (b) Identify and remove the unit productions from the following grammar:

$$\begin{aligned} S &\rightarrow A/bb \\ A &\rightarrow B/b \\ B &\rightarrow S/a \end{aligned}$$

5

6. Discuss importance of pushdown automata. Design a PDA to accept the language $L = \{a^n b^m c^{2(n+m)} | n \geq 0, m \geq 0\}$. 2+8

- 7(a) Differentiate between recursive and recursively enumerable languages. 3

- (b) Design a turing machine to accept the language $L = \{0^n 1^n 2^n | n \geq 0\}$.

- 8(a) Discuss halting problem. 5

- (b) Define partial derivation tree with an example. Why do you mean by ambiguous grammar? 3+2

9. Write short notes on any TWO: 2x5=10

(a) NP complete problems

(b) Church Turing Thesis

(c) Computational Complexity



PURBANCHAL UNIVERSITY**2015****B.E. (Computer)/Fourth Semester/Back**

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG274CO: Theory of Computation (Old Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks.

Answer EIGHT questions.

8×10 = 80

- 1(a) Prove by induction that $4^n - 1$ is divisible by z. 5
- (b) Design a DFA that accepts the language over $\Sigma = \{0, 1\}$ that has the set of all strings which do not contain two consecutive 0s. 5
- 2(a) Express the following sets defined over $\Sigma = \{0, 1\}$ in regular expression. 4
- (i) $L = \{0, 01, 10, 11\}$
 - (ii) $L = \{00, 001, 000011, 000000111, \dots\}$
- (b) Construct an NFA equivalent to following regular expression over $\Sigma = \{0, 1\}$ 6
- 10 $(0+1)^* 01$
- 3(a) Show that complement of a regular language is also regular. 4
- (b) Construct a PDA for language $\{a^n b^m c^m | m, n \geq 0\}$ over $\Sigma = \{a, b, c\}$. 6
- 4(a) Show that following grammar is ambiguous: 5
- $S \rightarrow OA | 1B$
- $A \rightarrow 0AA | 1s | 1$
- $B \rightarrow 1BB | 0S | 0$
- (b) Design a CFG that generates the language:
 $L = \{0^n 1^n | n \geq 0\}$ over $\Sigma = \{0, 1\}$. 5
- 5(a) Prove that CFLS are closed under union and concatenation. 5
- (b) Verify with suitable example that intersection of CFL with regular language may not be CFL. 5
- 6(a) State the formal definition of Turing machine and discuss about church hypothesis. 5

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.

8×10=80

- 1(a) What is state machine? Discuss significance of Finite Automata. 1+3
- (b) (i) Differentiate L^* & L^+ . 2+2+2
- (ii) Write Regular Expression for the language that has the set of all strings of 0's and 1's with at most one pair of consecutive 1's.
- (iii) Give English descriptions of the languages of the regular expression $(1+\epsilon)(00^*1)^*0^*$.
- 2(a) Differentiate between DFA and NFA with proper examples: 4
- (b) Design a DFA to accept strings over the alphabet {0,1} starting with at least two 0's and ending with at least two 1's. 6
- 3(a) State the Pumping Lemma and explain how it is used to prove that languages are not regular. 7
- (b) Write down the applications of Pumping Lemma. 3
4. Consider the grammar G given as: 5
 $S \rightarrow S+S \mid S^*S \mid (S) \mid b$
- (a) Show that the string $b=b+b^*b$ has two:
 (i) Parse trees
 (ii) Leftmost derivations
- (b) Find an unambiguous grammar G' equivalent to G. Explain with steps. 5

5. Differentiate CNF and GNF. Convert the grammar given as:
 $G(\{A_1, A_2, A_3\}, \{a, b\}, P, A_1)$ where P consists of the following:
 $A_1 \rightarrow A_2 A_3, A_2 \rightarrow A_3 A_1/b, A_3 \rightarrow A_1 A_2/a$ into Greibach Normal Form. 2+8
6. Give the formal definition of FDA. Differentiate DPDA and N FDA. Design a PDA that accepts the following language:
 $L = \{w \in \{a, b\}^* \mid n_a(w) = 2n_b(w)\}$. 2+2+6
- 7(a) Differentiate recursive and recursively enumerable languages. 4
 (b) Define a Turing Machine. Discuss its importance. Mention any two problems which can only be solved by TM. 1+2+3
8. Discuss NP complete problems. Why do we need to study computational complexity of a problem? Discuss. 7+3
9. Write short notes on:
 (a) Decision algorithm
 (b) Church's Hypothesis
 (c) Time complexity 5+5



PURBANCHAL UNIVERSITY

2017

B.E. (Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG377CO: Theory of Computation (New Course)

Candidates are required to give their answers in their own words as far as practicable.

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Answer EIGHT questions.

- 1(a) Define finite automata. Discuss its significance. 4
- (b) Using the mathematical induction principle prove that:
$$1+3+5+\dots+(2n-1)= n^2$$
 6
- 2(a) Explain moves of a PDA. 5
- (b) Discuss decision algorithm for Context Free Language. 5
- 3(a) Design a DFA to accept the language containing sub-string 0001 over the alphabet $\Sigma = \{0, 1\}$. 5
- (b) Prove with an example of your own that for each NFA, there is an equivalent DFA. 5
- 4(a) Using the pumping lemma for regular sets prove that the language $L = \{ww / w \in \{a, b\}^*\}$ is not regular. 4
- (b) Show that regular languages are closed under union and intersection. 6
- 5(a) How do you remove useless and unit productions from a CFG solution? 5
- (b) Convert following CFG into CNF:
 $S \rightarrow aXX$
 $X \rightarrow as/ba/a$ 5
- 6(a) Design a Turing machine that accepts the language of all the strings of even length. 5
- (b) Design a PDA for the language containing equal number of a's followed by equal number of b's. 5

Contd. ...

(2)

- 7(a) Differentiate between recursive and recursively enumerable languages. 5
- (b) What do you mean by instantaneous description of a TM? 5
8. Discuss ambiguous grammar and s-grammar with examples. Explain the significance of universal turing machine. 6+4
9. Write short notes on any TWO: 5+5
- (a) Computational Complexity
 - (b) Church Turing Thesis
 - (c) NP complete problems



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2019

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Answer EIGHT questions.

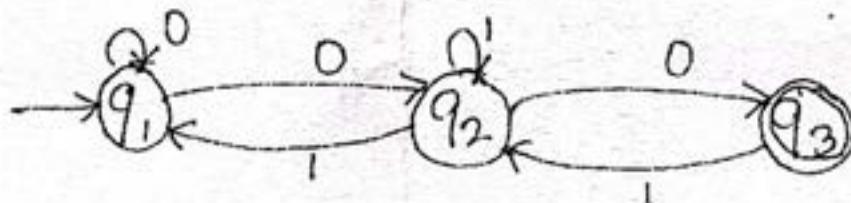
1(a) Prove the following series by principle of induction: 5

$8^n - 3^n$ is divisible by 5, for $n > 1$

(b) Define DFA and NFA with suitable example. Design a DFA that accepts the language over $\Sigma = \{a, b\}$ that has the set of all strings which contains the substring aba. 5

2(a) State and prove Arden's theorem. 3

(b) Convert finite automata given below to its corresponding regular expression, using Arden's theorem.



Where, q_1 is the initial state and q_3 is the final state. 7

3. State and prove Pumping lemma for regular sets. Prove $0^n 1^n$ is not regular. 5+5

4(a) Define ambiguous grammar and simple grammar with examples. 5

(b) Define derivation tree and Ambiguity of grammar with suitable example. 5

5. Discuss the moves of PDA. Design a PDA which accepts the given language $L = \{WCW^R \text{ where } W \in \{a, b\}^*\}$. Test whether the PDA you developed accepts the string aabcbaa. 2+6+2

(2)

6. State Turing machine(TM) with block diagram and formal mathematical definition. Design a TM that accepts the language of all strings of even length. 3+7
7. State and prove the pumping lemma for context free language(CFL). Show that $a^n b^n c^n$ is not CFL. 5+5
- 8(a) What is recursive and recursively enumerable language ? Mention it's properties. 5
- (b) What are intractable problems? Discuss. 5
9. Write short notes on any TWO: 2×5=10
- (a) NP complete problem
 - (b) Regular expression
 - (c) Universal Turing machine



PURBANCHAL UNIVERSITY

2023

B. E. (Computer)/Sixth Semester/Final

Time: 3 hours

Full Marks: 40 /Pass Marks: 16

BEG391MS: Project and Organization Management (New Course)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group A

Answer TWO questions.

2×8=16

1. Define Project Management. Explain project environment in brief.
2. Define management and list out function of management. Why it is important for an engineer to have knowledge of management?
3. Given is the following information regarding a project:

Activity	A	B	C	D	E	F	G	H	I	J	K	L
Predecessor	-	-	-	AB	B	B	FC	B	EH	EH	CDF	JK
Duration (days)	4	4	3	5	1	3	6	4	4	2	1	5

Draw the Network Diagram and identify the Critical Path and Project Duration. Find the ES, EF, LS, LF and slack time..

Group B

Answer SIX questions.

6×4=24

4. Describe characteristics of project.
5. Differentiate between tall and flat organization design.
6. What do you mean by job analysis? Explain.
7. How manager differs from a leader?

Write short notes on any TWO:

2×2=4

(a) Trade union movement in Nepal

(b) Project lifecycle

(c) WBS

(d) Time management

9. What do you mean by Industrial Relationship? Describe its objectives in brief.

Contd. ...

(2)

10. What is compensation and how can it be implemented in organization?

PURBANCHAL UNIVERSITY**2022**B. E. (Computer)/Sixth Semester/Final
Time: 01:30 hrs.

Full Marks: 40 /Pass Marks: 16

BEG391MS: Project and Organization Management (New Course)*Candidates are required to give their answers in their own words as far as practicable.**The figures in the margin indicate full marks.***Group A****Answer TWO questions.** **$2 \times 8 = 16$**

1. Define project management. Explain the various phases of project life cycle.
2. Construct a network diagram and find out the critical path, critical activities, early start time, late start time, early finish time, late finish time, float time for each activity from the information given in the following table.

Task	Expected Task Time	Immediate Predecessors
A. Procure New Machine	12 Days	None
B. Run Electric Lines	10	None
C. Remove Old Machine	8	None
D. Prepare Mounting Pad	4	C
E. Prepare material Handling Connects	5	D
F. Install New Machine	3	A, E
G. Install Wiring Harness	4	F, B
H. Connect Material Handling	8	F
I. Pretest	5	G
J. Final Test	5	H, I

"Neither all managers are leaders nor all leaders are managers". Explain this statement clearly showing the difference between managers and leaders.

Contd. ...

(2)
Group B

Answer SIX questions.

4. Explain different levels of management. $6 \times 4 = 24$
5. Mention the social, economical and environmental impacts of projects.
6. What do you understand by project charter? Explain the significance of work break down structure in detail.
7. Differentiate between CPM and PERT.
8. Explain various functions of management.
9. What is meant by Management by Objectives (MBO)? Mention the benefits of MBO in reference to job analysis and job description.
10. Explain three main types of leadership styles.
11. Write short notes on any TWO:
(a) Time management and its importance
(b) Necessity of industrial relations
(c) Health, Safety and compensation $2 \times 2 = 4$



PURBANCHAL UNIVERSITY
2021

B. E. (Computer) / Sixth Semester / Final

Time: 01:30 hrs.

Full Marks: 40 / Pass Marks: 16

BEG391MS: Project and Organization Management (New Course)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group A

Answer TWO questions.

2×8=16

1. Define project management. Explain different stages in project life cycle.
2. Explain the concept of management. Describe the functions of management.
3. Draw a network diagram from the following given data and find total minimum project time of completion, critical activities and EST, EFT, LST, LFT, TF and FF.

Activities	Time in days	Predecessor
A	3	-
B	2	-
C	4	A
D	3	B
E	3	B
F	3	C
G	2	C,D
H	5	F
I	3	E,G

Group B

Answer SIX questions.

6×4=24

4. Describe project environment and explain environmental impact on project.
5. What is leadership? Explain the different types of leadership styles.

Contd. ...

(2)

6. Differentiate between MBO and MBE.
7. How can an employee be motivated without paying extra amount? Explain.
8. Describe the importance of job analysis in an organization.
9. Explain project control cycle in brief.
10. Write short notes on any TWO:
 - (a) Compensation
 - (b) WBS
 - (c) Time management
 - (d) Levels of management

$2 \times 2 = 4$



Ans

4. D

PURBANCHAL UNIVERSITY

2016

B. E. (Computer)/Sixth Semester/Final

Time: 01:30 hrs.

Full Marks: 40 / Pass Marks: 16

BEG391MS: Project and Organization Management (New Course)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group A

Answer TWO questions.

2x8=16

1. Define project. What do you mean by project environment? Describe three main project environments.
2. Draw a CPM network for the project activities shown below. Calculate EST, EFT, LST, LFT, FF, TF, IF, Int F and the critical path of the project.

Activity	A	B	C	D	E	F	G	H	I
Immediate Predecessor	-	-	-	A	A	B,D	C	C	F,G
Duration	6	8	9	10	13	11	10	10	10

3. "Management is the art of getting things done through people." Do you agree with this statement? Explain functions and skills of management.

Group B

Answer SIX questions.

6x4=24

4. Define organization and list out its types.
5. Explain the different levels of management.
6. What do you mean by project control cycle? Explain with figure.
7. What are the primary uses of job description?
8. Discuss about management by objectives. Why is it important for middle level management?
9. Explain goal setting theory of motivation.
10. Explain the trade union movement in Nepal.
11. Describe the Project Information Management System.



PURBANCHAL UNIVERSITY**2019**

B. E. (Computer)/Sixth Semester /Final

Time: 01:30 hrs.

Full Marks: 40 / Pass Marks: 16

BEG391MS: Project and Organization Management (New Course)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group A**Answer TWO questions.****2x8=16**

- Explain the concept of project management and project environment. Discuss the social economical, environmental impact of project.
- Explain Project Implementation and Project Planning phase. Describe why project implementation phase is considered as the most important phase.
- Write at least five differences between PERT and CPM. Draw a Network diagram for the following: Find: A Critical path/Critical activities

2+6**B Minimum completion time of the Project****C Find ES, EF, LS, LF, and IF, FF and IF**

Activities	Predecessors	Duration(Days)
A	None	2
B	None	3
C	None	4
D	A	5
E	D,B	6
F	C	7
G	B,E	8
H	F	9
I	G,H	10

Group B**Answer SIX questions.****6x4=24**

- Differentiate between HRM and Personnel Management. Describe different functions of Personnel Management.

Contd. ...

- (2)
5. Explain the concept of trade union. Discuss trade union movement in Nepal.
 6. Explain different functions and roles of management.
 7. Explain the characteristics of organization.
 8. Define the concept of management. Explain Management by objectives.
 9. Why is organization chart prepared in an organization?
 10. Explain the necessity of industrial relationship.
 11. Write short notes on any TWO:

(a) Project Proposal.
(b) Feasibility Study.
(c) Role of Manager/Management

$$2 \times 2 = 4$$

PURBANCHAL UNIVERSITY

2018

B. E. (Computer)/Sixth Semester/Final

Time: 01:30 hrs.

Full Marks: 40 /Pass Marks: 16

BEG391MS: Project and Organization Management (New Course)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group A

Answer TWO questions.

2x8=16

1. Describe the concept of project management. Explain social, economical and environmental impacts of project critically.
2. Draw a Critical Path Method (CPM) Network and find the project duration, critical path, critical activities early start time, late start time, early finish time, late finish time and total float for each activity.

Activity	A	B	C	D	E	F	G	H	I
Predecessor	-	A	A	A	B	C	D	C,E	F,G
Successor	B,C,D	E	F,H	G	H	I	I	-	-
Duration (Days)	10	6	4	6	4	2	6	2	4

3. What is meant by Management by Objectives (MBO). Explain the benefits from MBO program.

Group B

Answer SIX questions.

6x4=24

4. Explain the implication of CPM and PERT in Network Analysis.
5. Define the concept of organization and explain its characteristics briefly.
6. Explain the necessary of industrial relationship.
7. Why is Gantt chart necessary for planning and controlling of project?
8. Explain the different functions of personnel management.
9. Explain briefly about project control cycle.
10. What do you mean by Leadership Styles? Briefly explain any one of the theories on leadership.

Contd. ...

(2)

11. Write short notes on any TWO:

- (a) Work Breakdown Structure (WBS)
- (b) Function of Personnel Management
- (c) Necessity of Industrial Relation



PURBANCHAL UNIVERSITY

2017

B. E. (Computer)/Sixth Semester/Final

Time: 01:30 hrs.

Full Marks: 40 /Pass Marks: 16

BEG391MS: Project and Organization Management (New Course)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group A

Answer TWO questions.

2×8=16

1. What do you understand by project and project life cycle? Explain briefly the activities to be done in the implementation phase of the project.
2. What is management? Discuss the functions and roles of management in detail.
- 3(a) Draw the network diagram of the project from the provided information at the project given in the table below: Compute Earliest Start time (EST), Latest Start Time (LST) Earliest Finish Time (EFT), Latest Finish Time (LFT) and total float (Slack Time).
- (b) Determine the critical Path of the project path of the project.

Activity	A	B	C	D	E	F
Predecessor	-	-	B	A	A	C,E
Expected Time	14	19	15	6	12	3

Group B

Answer SIX questions.

6×4=24

4. What is organization? What are its features?
5. Discuss the characteristics of project management.
6. Differentiate between CPM and PERT.
7. Define Job Analysis and Job description.
8. Explain the process of Management by objectives.
9. Explain different styles of leadership.
10. Describe trade union and trade union movement in Nepal.
11. Define motivation. Discuss MC Gregor's Theory of motivation.



PURBANCHAL UNIVERSITY

2016

B. E. (Computer/Electronics & Comm.)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG203SH: Probability & Statistics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

Students are allowed the Statistical Table (Standard Normal Table, T-distribution Table and Chi-square Table).

Answer EIGHT questions.

8×10=80

- 1(a) Discuss the functions and limitations of Statistics.
(b) The mean and standard deviation of set of 50 observations were found to be 40 and 12 respectively. On checking, it was found that two observations were wrongly taken as 23 and 15 instead of 43 and 18. Calculate correct mean and standard deviation.
- 2(a) What do you mean by correlation. Discuss the properties of correlation coefficient(r).
(b) Fit the regression equations of Y on X from the following data:

X	11	12	13	14	15	16
Y	11	13	15	17	19	20

Also, estimate y when x=30.

- 3(a) Write short notes on:
(i) Dependent and independent events
(ii) Sample space and exhaustive events.
(b) A husband and wife appears in an interview for two vacancies in the same post. The probability of husband's selection is $1/7$, and that of wife's selection is $1/5$. What is the probability that:
(i) both of them will be selected?, (ii) only one of them will be selected?, (iii) none of them will be selected?
- 4(a) Discuss on probability mass function and distribution function.
(b) The probability density function of a random variable X is given below:

$$f(x) = \begin{cases} Kx^3 & 0 \leq x \leq 1 \\ 0, & \text{otherwise} \end{cases}$$

Contd. ...

(2)

- (i) If $f(x)$ is a probability density function find the value of K.
(ii) Find the mean and variance of X.
- 5(a) Under what conditions Binomial Distribution possesses Poisson Distribution? Explain.
- (b) A certain screw making machine produces on an average 3 defective screws in a lot. Find the probability that this lot has:
(i) none of the screw are defective
(ii) at least one of the screw are defective
(iii) exactly one of the screw is defective
- 6(a) Define normal distribution. Discuss the property of normal distribution.
- (b) A sample of 100 mobile battery cells tested to find the length of life produced the following results as mean 13 months and standard deviation of 3 months. Assuming that the data are normally distributed. What percentage of battery cells expected to have life (i) more than 15 months? (ii) less than 6 months? (iii) between 8 months and 12 months?
- 7(a) Define the terms population parameter and sample statistics. Write down the standard error of mean and proportion.
- (b) The quality control engineer at a light bulb factory needs to estimate the average life of a large shipment of light bulbs. The process standard deviation is known to be 100 hours. A random sample of 64 light bulbs indicated a sample average life of 350 hours. Calculate the standard error of mean. Set up 95% and 99% confidence interval of the true average life of light bulbs.
- 8(a) Write down the necessary steps of hypothesis testing of difference of proportion.
- (b) A Company claims that its light bulbs are superior to those of its main competitor. If a study showed that a sample of 40 of its bulb has mean lifetime of 647 hours. of continuous use with standard deviation of 27 hours., while a sample of 40 bulbs made by its main competitor had mean lifetime of 638 hours of continuous use with standard deviation of 31 hours, does this substantiate the claim at 5% level of significance?

(3)

- 9(a) Define t-distribution and write down the application of t-distribution.
- (b) Two independent samples of 7 and 8 items respectively had the following values, whether these two samples are drawn from a sample population or not.

Sample-I	9	11	13	11	15	9	12	14
Sample-II	10	12	10	14	9	8	10	-

- 10(a) Define chi-square test. What are the applications of chi-square test?
- (b) Test of the fidelity and selectivity of 190 radio receivers produced the results shown in the following table. Use the 0.05 level of significance to test whether there is a relationship between fidelity and selectivity.

Selectivity \ Fidelity	Low	Average	High
Low	6	12	32
Average	33	61	18
High	13	15	0

PURBANCHAL UNIVERSITY**2017**

B. E. (Computer/Electronics & Comm.)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG203SH: Probability & Statistics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

Students are allowed the Statistical Table (Standard Normal Table, T-distribution Table and Chi-square Table).

Group A**Answer FOUR questions.****4×(5+6)=44**

- 1(a) Discuss central tendency and dispersion. 5
 (b) Define standard deviation. Scores of two golfers for 10 rounds were as follows:

Golfer A:	74, 75, 78, 78, 72, 77, 79, 78, 81, 76
Golfer B:	86, 84, 80, 88, 89, 85, 86, 82, 82, 79

Find which golfer may be considered to be a more consistent player. 6

- 2(a) Define probability. Hence state and prove theorem of probability. 5
 (b) A bag contains 4 red and 5 black balls. The balls are drawn one after another with replacement. Find the probability of getting:
 (i) both red balls, (ii) first red and second black balls, (iii) first black and second red balls, (iv) both black balls. 6

- 3(a) A random variable X has the following probability function:

X	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

Find value of k and calculate mean and variance of X. 5

- (b) Find the mathematical expectation and standard deviation of numbers on dice. 6

Contd. ...

(2)

4(a) Show that mean and variance of Poisson distribution are equal. 5

(b) A quality control engineer inspects a random sample of 3 batteries from each lot of 24 car batteries ready to be shipped. If such a lot contains six batteries with slight defects. What are the probabilities that the inspector's sample will contain: (i) none of the batteries with defects, (ii) only of the batteries with defect, (iii) at least two of the batteries with defects. 6

5(a) Discuss difference between discrete probability distributions and continuous probability distributions with suitable examples. 5

(b) Five coins are thrown simultaneously. Find the probability getting: (i) no heads, (ii) at least one head, (iii) at most 4 heads. 6

6(a) Define the term normal distribution. What are the properties of normal distribution? 5

(b) In a normal distribution 7% of item are under 64 and 60% of the items are over 80. Find the mean and standard deviation of the distribution. 6

Group B

$3 \times (6+6)=36$

Answer THREE questions.

7(a) Describe estimation and its types. 6

(b) If 36 of 100 persons interviewed are familiar with the tax incentives for installing certain energy saving devices, construct a 95% confidence interval for the corresponding true proportion. 6

8(a) What are the steps in test of significance of a difference of mean for a large sample? Describe the error in hypothesis testing. 6

(b) In a sample of 600 men from City A, 450 are found to be smokers. In a sample of 900 from City B, 550 are found to be smokers. Do the data indicate that the two cities are significantly different with respect to prevalence of smoking habit among men? 6

Contd. ...

(3)

On what basis we give decision of test of hypothesis? Describe the test procedure of pair t-test. 6

Ten individuals are chosen at random from a population and their height in inches are found to be 63, 63, 66, 66, 67, 68, 69, 70, 71, 71. In the light of these data discuss the suggestion that the mean height in the population is 66 inches. 6

- a) Write down the steps for chi-square test of independence of attributes. 6
- b) From the following data between age of husbands and wives. Calculate the two regression equations and find the husband's age when wife's age is 20: 6

Wife's age:	18	20	22	23	27	28	30
Husband's age:	23	25	27	30	32	31	38



PURBANCHAL UNIVERSITY
2019

B. E. (Computer/Electronics & Comm.)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG203SH: Probability & Statistics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

Students are allowed the Statistical Table (Standard Normal Table, T-distribution Table and Chi-square Table).

Answer EIGHT questions.

8×10=80

- Prepare a brief note on application of statistics in Engineering.
- Following observation from two different cathode ray tubes that used air as the gas:

Tube I	0.57	0.34	0.43	0.32	0.48	0.40	0.40
Tube II	0.53	0.47	0.47	0.51	0.63	0.61	0.48

Which tube is more homogeneous and why

- Define Karl Pearson correlation coefficient and write down its basic properties.
- Find out the regression line of dependent variable Y on independent variable X for the following data. Also estimate the value of Y when the value of X is 65.

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

- State and prove the multiplicative theorem of probability.
- There are two machines in a factory. The probability of machine X works 24 hours without failure is 0.8 and the probability of machine Y working 24 hours without failure is 0.5. Find the probability that
 - Both machines will work for 24 hours without failure.
 - Only one machine will work for 24 hours without failure.
 - None of the machine will work for 24 hours without failure.
- If a random variable X forms the following function.

X	3	2	1	0	-1	-2	-3
P(x)	0.1	0.2	3k	k	2k	0	0.1

Find the value of k. Also find the mean and variance of X.

Contd. ...

(2)

- (b) The Probability density of a random variable X is given below
- $$f(x) = \begin{cases} kx^2, & 0 < x < 3 \\ 0, & \text{otherwise} \end{cases}$$
- (i) If $f(x)$ is a probability density function find the value of constant K
- (ii) $P(1 < x < 2)$
- (iii) Find the distribution function of given density function.
- 5(a) Define the Poisson distribution. Discuss its properties.
- (b) If we inspect 10 items at random for a Binomial distribution and found that the following relation $P(X = 2) = 3 P(X = 3)$. Find the probability that the random variable
- (i) $P(X=0)$ (ii) $P(X=3)$ (iii) $P(X \leq 3)$ (iv) $P(X \geq 3)$
- 6(a) Define continuous random variable. Mention fundamental properties of normal distribution.
- (b) An Electrical engineer has found that the standard house hold light bulbs produced by a certain manufacturer have a useful life that is normal distributed with mean of 250 hours and a variance of 2500. what is the probability that a randomly selected bulb from this production process will have a useful life.
- (i) In excess of 300 hours (ii) Between 190 and 270 hours
(iii) Not exceeding 200 hours.
- 7(a) Define Standard error of estimation. Differentiate between parameter and statistic.
- (b) A reading test is given to an elementary school class that consists of 12 boys and 10 girls. The results of the test are as follows:
- | Mean | Boys | Girls |
|-------|------|-------|
| S. D. | 74 | 70 |
| | 8 | 10 |
- Find the 95% Confidence limits of difference.

(3)

- 8(a) Write down the general steps of test of significance of difference of proportion of success.
- (b) The breaking strength of cable produced by a manufacturer have a mean of 1800 pounds and standard deviation of 100 lbs. by a new technique in the manufacturing process, it is claimed that the breaking strength can be increased. To test this claim, a sample of 50 cables is tested and it is found that the mean breaking strength is 1850 lbs. Can we support the claim at the 0.01 level of significance.

9(a) Write down the steps of paired t-test.

- (b) A time study engineer developed a new sequence of operation elements that he hopes will reduce the mean cycle time of a certain production process. The results of a time study of 20 cycles are given below: Cycle time in minutes:

12.25, 11.97, 12.15, 12.08, 12.31, 12.28, 11.94, 11.89, 12.16, 12.04,
12.09, 12.15, 12.14, 12.47, 11.98, 12.04, 12.11, 12.25, 12.15, 12.34,

If the present mean cycle time is 12.5 minutes, Should he adopt the new sequence at 1% level of significance?

- 10(a) The theory predicts the proportion of beans, in the four groups A, B, C, and D should be 9:3:3:1. In an experiment among 1600 beans, the numbers in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory? Test at 5% level of significance.
- (b) The following is the distribution of the hourly number of truck arriving at a company's warehouse. Fit the Poisson distribution and test the goodness of fit at 5% level of significance.

Trucks arriving per hour	Frequency
0	52
1	151
2	130
3	102
4	45
5	12
6	5
7	1
8	2

PURBANCHAL UNIVERSITY

2022

B. E. (Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG376CO: Multimedia Computing & Technology (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side. Necessary Tables are may be used.

Answer EIGHT questions.

- 1(a) Define multimedia system. Explain linear and Non-linear multimedia in detail. 4
- (b) Define continuous media. Explain data stream characteristics for continuous media. 6
- 2(a) Explain MIDI message and list MIDI software along with brief description. 6
- (b) Explain mechanism for generation of speech. 4
- 3(a) Describe image recognition process with help of suitable diagram. 7
- (b) What is computer graphics? 3
- 4(a) Define digitization. Explain video file format with examples. 5
- (b) Describe computer based animation. 5
5. Explain data compression technique with example. Also mention importance of compression technique. 10
- 6(a) What are the steps of the JPEG compression process? 5
- (b) Explain working principle of CD-ROM. 5
- 7(a) Describe the relation between hypertext and multimedia system. 4
- (b) Explain document architecture of SGML. 6
- 8(a) What is abstract for programming? Explain different abstraction level. 1+3

Contd. ...

(2)

- (b) Differentiate between EDF and Rate monotonic scheduling algorithm.
9. Write short notes on any TWO:
- (a) Multimedia communication architecture
 - (b) Role of multimedia in educational sector
 - (c) Synchronization



PURBANCHAL UNIVERSITY

2021

B. E. (Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG376CO: Multimedia Computing & Technology (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side. Necessary Tables are may be used.

Answer EIGHT questions.

- 1(a) Describe role of MM system along with its characteristics. Explain classification of media in MM. 2+5
- (b) Describe synchronous, asynchronous and isochronous transmission mode. 3
2. Explain speech analysis system. Describe MIDI messages and speech generation steps. 2+8
3. How images and graphics are represented in computer system? Explain image reorganization step with appropriate figure. 3+7
4. How stored image differ from captured image? Explain animation languages 4+6
5. Why compression is essential for MM system? Explain JPEG compression technique in brief. 3+7
6. Define the term multimedia document architecture and OPA. Explain SGML. 6+4
- 7(a) Why Qos is important issue need to be considered? 2
(b) Explain application and transport subsystem. 8
- 8(a) What are major issues of synchronization. Explain intra and inter frame synchronization. 6
(b) Explain CD-DA technology. 4
9. Write short notes on any TWO: 2×5=10
 - (a) Rate monotonic algorithm
 - (b) Video on demand
 - (c) Collaborative computing



PURBANCHAL UNIVERSITY

2018

B. E. (Computer) / Sixth Semester / Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG376CO: Multimedia Computing & Technology (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side. Necessary Tables are may be used.

Answer EIGHT questions.

- 1(a) Define multimedia system. What are the characteristics of multimedia system. 2+3
- (b) Explain different modes of data transmission in brief. 5
- 2(a) Explain MIDI hardware and list MIDI software along with brief description. 5+2
- (b) What are the techniques for speech transmission? 3
- 3(a) Explain the framework of interactive graphics system. 5
- (b) Explain different types of image format used in image representation. 5
- 4(a) Define computer based animation. Explain methods of controlling animation. 1+4
- (b) Explain the major steps of data compression in detail. 5
- 5(a) Describe reference model for multimedia synchronization. 5
- (b) What is extended architecture? Discuss principle of CD write-once. 2+3
- 6(a) Explain Open Document Architecture. 4
- (b) Explain quality of service and resource management with an appropriate figure. 6
7. Explain the concept of earliest deadline first algorithm. Compare and contrast it with rate monotonic algorithm. 4+6
8. What are the abstraction levels used in programming? Explain the advantages of object oriented approaches in brief. 5+5

Contd. ...

(2)

9. Write short notes on any TWO:

- (a) Transport sub-system
- (b) Video conferencing and digital libraries
- (c) Hypertext, hypermedia and multimedia



PURBANCHAL UNIVERSITY
2019

B. E. (Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG376CO: Multimedia Computing & Technology (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side. Necessary Tables are may be used.

Answer EIGHT questions.

- | | |
|--|--------|
| 1(a) Define multimedia and multimedia system with its properties. | 4 |
| (b) Explain the different types of media with example. | 6 |
| 2(a) Explain MIDI components and MIDI messages. | 5 |
| (b) How the speech can be generated and analyzed? | 5 |
| 3. Define image and graphics. Explain the image recognition with its steps. | 2+8 |
| 4(a) Define animation. Explain animation language with example. | 5 |
| (b) Explain the visual representation. | 5 |
| 5. Explain data compression techniques with example. Explain the importance of compression technique. | 7+3 |
| 6(a) Explain the steps of the JPEG compression process. | 5 |
| (b) Describe CD-ROM with its limitations. | 5 |
| 7. Describe the relation between hypertext and multimedia system. Explain document architecture of ODA. | 4+6 |
| 8. Explain the requirements of resource management. Differentiate between EDF and Rate monotonic scheduling algorithm. | 3+7 |
| 9. Write short notes on any TWO: | 2×5=10 |
| (a) MM communication architecture. | |
| (b) Object-oriented approaches in multimedia system. | |
| (c) Role of MM in education sector. | |

PURBANCHAL UNIVERSITY
2016

Bachelor in Information Technology (B.I.T.)/Eighth Semester/*Back*

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BIT421CS: Multimedia Communication (Old Course)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group A

Answer TWO questions.

2×12=24

1. Explain multicasting and resource reservation protocol (RSVP) in brief. Explain how video streaming is possible for multiple users. 4+8
2. What are the architectural aspects of audio coding standards? Discuss how the MPEG-4 Advanced Audio Coding provides the highest quality audio at low quality rate 4+8
3. How H-series Terminals are interoperable with each other? Explain H.320 coding standards suite. 4+8

Group B

Answer SEVEN questions.

7×8=56

4. What are the key technologies for telecommunication development? Explain the future of telecommunication standards with reference to four traffic hypothesis. 4+4
5. Represent Engineering aspects for speech synthesis. Explain ITU G.722 sub-band coding approach of speech coding standards. 2+6
6. Explain the features of access network and backbone network in brief. 4+4
7. Differentiate between lossless and lossy compression techniques. List out any four image compression standards? Explain the JPEG Modes of operation? 2+2+4

Contd. ...

(2)

8. Discuss the pre-echo control and the psychoacoustic model in brief.
9. Define MOS? Explain open loop and close loop linear prediction in brief. 4+4
10. Mention the function of Gatekeepers and Gateways. Explain H.245 control protocol in brief. 2+6
11. What are the major improvements of JPEG2000 over traditional standards? Explain JPEG-LS in brief. 4+4
12. Write short notes on any TWO:
(a) Philips PASC
(b) Bi-level image compression
(c) Multipoint conferencing 2x4=8



PURBANCHAL UNIVERSITY

2023

B.E. (Civil/Electronics & Comm./Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 / Pass Marks: 32

BEG395MS: Engineering Economics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer FIVE questions.

5×16=80

- 1(a) Suppose you make equal annual deposits of Rs 100000 into a fund that pays a nominal interest of 12% per year compounded semi annually. Find the balances at the end of year five. 8
- (b) What is engineering economics? Why is it important for project implementation? What are its principles? 8
- 2(a) The information given below show the records of a manufacturing company using standard costing system: 10

	Standards	Actual
Production (Units)	2,500	2,000
Direct Material (kg)	9,000	8,000
Direct Material Cost (Rs)	2,70,000	2,18,750
Direct labours (Hrs)	9,000	10,000
Direct labours cost (Rs)	1,80,000	2,50,000
Variable Overheads (Rs)	1,00,000	1,00,000

Calculate:

- Total material variance *54,000/-*
- Total wage variance *106,000/-*
- Variable overheads variance *708,000/-*

Also indicate the adverse and favorable condition.

- (b) With an example, explain ERR method. 6
- 3(a) Find the both types of BC ratio using present worth formula where: 8

Contd. ...

...which project would you select on the basis of the

Contd. ...

(2)

Investment	Rs 2,50,000
Useful life	10 years
Interest	8%
Annual benefits	R 1,00,000
Annual total cost	Rs 44,000
Salvage value	Rs 40,000

- (b) Evaluate using FW formulation, whether the following project is feasible or not:

6

End of year	Net cash flow (in Rs.)
0	-4,00,000
1	95,000
2	95,000
3	95,000
4	95,000
5	1,40,000

Take MARR = 12% per year.

- 4(a) In the design of a special use structure, two mutually exclusive alternatives are under consideration. The economic estimates are as follows:

10

	A	B
Capital investment	55,000	1,20,000
Annual expenses	-9,000	-5,500
Useful life (Yrs)	20	50
Market value at the end of useful life	10,000	22,000

- 15?
- 2,01

If perpetual service from the structure is assumed, which design alternative should be recommended? The MARR is 10% per year. Use cotermination method.

- (b) Why marketing research is needed? Explain.

6

- 5(a) Perform sensitivity analysis by investigating the annual worth of the following project over the range of $\pm 40\%$ in (i) Initial investment (ii) Annual net revenue (iii) Salvage value (iv) Useful life.

10

(3)

Initial investment	5,00,000
Revenues per year	1,30,000
Expenses per year	1,0000
Salvage value	5,000
Useful life	15 yrs
MARR	15%

Draw also the sensitivity diagram.

- (b) What do you understand by value added tax (VAT)? Explain. 6
6. Write short notes on any FOUR: $4 \times 4 = 16$
- (a) Decision tree
 - (b) Elements of cost
 - (c) Break even analysis
 - (d) Time value of money
 - (e) Cash flow diagram
 - (f) Payback period

73.40
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PURBANCHAL UNIVERSITY
2022

B.E. (Civil/Electronics & Comm./Computer)/Sixth Semester/*Final*

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG395MS: Engineering Economics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer FIVE questions.

- 1(a) What is engineering Economics? Describe about the principles of engineering economics. 2+4

- (b) Following are the cost data for the production of 100 badminton racquets:

Labor rate	Rs 40/hr
Leather	50 m @ Rs 200/m
Gut	300 m @ Rs 50/m
Graphite	100kg @ Rs 200/kg
Labor hours needed	200 hrs
Total annual factory overhead	Rs 5000000
Total annual direct labour hours	250000 hrs

Break down the costs into components of prime costs and overhead costs and find out the manufacturing cost of each racquet. 10

- 2(a) Differentiate between nominal and effective interest rates with example. 6

- (b) Anit and Bandana have just opened two savings accounts at Nepal Bank Ltd. The accounts earn 10% annual interest. Anit wants to deposit Rs 1000 in his account at the end of the first year and increase this amount by Rs 300 for each of the next five years. Bandana wants to deposit an equal amount each year for the next six years. What should be the size of Bandana's annual deposit so that the two accounts will have equal balances at the end of six years? 10

- 3(a) Define ERR. Explain the drawbacks of IRR methods. 2+4

- (b) Consider the following three sets of mutually exclusive alternatives. Which project would you select on the basis of the

(2)

external rate of return on incremental investment, assuming that
MARR = 15%. 10

Years	A1 (Rs)	A2 (Rs)	A3 (Rs)
0	-20000	-10000	-30000
1	15000	8000	15000
2	10000	5000	20000
3	8000	5000	10000

- 4(a) What is the significance of payback period method? What are its drawbacks? 3+3
- (b) Make a selection from the following two mutually exclusive alternatives if MARR is 10% per year: 10

Alternative	A	B
Capital investment, Rs	450000	600000
Annual Revenue, Rs	22000	26000
Annual Expenses, Rs	7450	11020
Useful Life, yrs	6	8
Market Value, Rs	25000	28000

Use coterminated assumption.

- 5(a) Define benefit-cost ratio? Explain its types. 3+3
- (b) Perform sensitivity analysis for a project of useful life 10 years using PW method over a range of $\pm 40\%$ in (i) initial investment, (ii) net annual revenue, (iii) salvage value, and (iv) useful life. Assume MARR: 12% per year. 10

Initial investment: Rs. 200000

Annual Revenues: Rs. 50000

Annual Expenses: Rs. 5000

Salvage value: Rs. 25000

6. Write short notes on any FOUR: 4x4=16

- (a) Re captured Depreciation
- (b) Demand Analysis
- (c) Job costing
- (d) VAT
- (e) Elements of cost



PURBANCHAL UNIVERSITY
2021

B.E. (Civil/Electronics & Comm./Computer)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG395MS: Engineering Economics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer FIVE questions.

- 1(a) Explain about different types of economic system. 5
- (b) The information given below shows the records of a manufacturing company comparing the actual data with the data from the standard cost card:

	Standard	Actual
Production (Unit)	5000	4000
Direct material (kg)	12000	15000
Direct material cost (Rs)	250000	210000
Direct labour (Hrs)	10000	12000
Direct labour cost (Rs)	170000	250000
Fixed overheads (Rs)	270000	260000
Variable overheads (Rs)	135000	145000

Calculate:

- (a) Total material cost variance
- (b) Total wage variance
- (c) Fixed overhead variance
- (d) Variable overheads variance

Indicate the separate components of each variable .Also indicate favorable and adverse.

11

Contd. ...

(2)

- 2(a) The flows of the cash are given below:

End of the year	Cash flows (Rs)
1	-8000
2	-7000
3	-6000
4	-5000

Calculate the present equivalent and future equivalent at $i = 15\%$ per year.

- (b) What is payback period method? Explain with the help of an example. 6
- 3(a) Define and express both types of B/C ratio for PW method. 6
- (b) Find both types of B/C ratio using AW formulation of the following project and find whether the project is feasible or not. 10

Initial investment	Rs 700000
Annual revenue	Rs 90000
Annual O & M cost	Rs 26000
Salvage value	Rs 14000
Useful life	15 years
MARR	12%

- 4(a) Suppose you are analyzing the following three mutually exclusive alternatives for a small investment project. Using ERR method choose the better alternative. The useful life of each alternative is 10 years and the MARR is 10% per year ALTERNATIVE 12

	A	B	C
Capital investment (Rs)	900	1500	2500
Annual revenue less Exp. (Rs)	150	270	400

(b) What are mutually exclusive, independent and contingent projects?

(2)

- 5(a) Perform sensitivity analysis by investigating FW over a range of \pm 40% changes in the estimates for: 12

- Investment
- Annual net cash flow
- Market value
- Useful life.

Initial investment, (Rs) = 220000

Annual Revenue (Rs) = 70000

Annual expenses (Rs) = 35000

Salvage value (Rs) = 15000

Useful life (years) = 14

MARR = 11 % per year

Draw also the spider plot

- (b) What are the taxation laws in Nepal? Explain. 4

6. Write short notes on any FOUR: 4x4=16

- (a) Job and process costing
- (b) IRR and Pay back period
- (c) Break-even analysis
- (d) Recaptured depreciation
- (f) market research



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PURBANCHAL UNIVERSITY
2016

B.E. (Civil/Computer/E. & C.)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG395MS: Engineering Economics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer FIVE questions.

5×16=80

- 1(a) Explain the principles of Engineering Economics. Explain the economic system of Nepal. 8
- (b) Find prime cost, overhead cost, non manufacturing costs, total cost and profit for the following: 8
- | | |
|---|-----------------|
| Direct material | : Rs. 24,00,000 |
| Direct labor | : Rs. 5,00,000 |
| Depreciation for factory building | : Rs. 1500 |
| Branch office expenses | : Rs. 40,000 |
| Depreciation for office building | : Rs. 8,000 |
| Depreciation of staff cars | : Rs. 12,000 |
| Insurance: | |
| Staff cars | : Rs. 1500 |
| Office building | : Rs. 1200 |
| Factory building | : Rs. 1500 |
| Delivery van maintenance and running expenses | : Rs. 1600 |
| Salaries including sales manager and factory chief engineer | : Rs. 3,00,000 |
| Salary of sales manager | : Rs. 25,000 |
| Factory chief engineer | : Rs. 25,000 |
| Finished goods warehouse expenses | : Rs. 20,000 |
| Electricity (including Rs. 4000 for administrative office) | : Rs. 40,000 |
| Advertisement | : Rs. 20,000 |
| Sundry factory expenses | : Rs. 3,40,000 |
| Sales promotion | : Rs. 5,000 |
| Office administration expenses | : Rs. 50,000 |
| Expenses for participating in industrial exhibition | : Rs. 10,000 |
| Sales | : Rs. 42,00,000 |

Contd. ...

(2)

- 2(a) A Construction Company is assigned to start up a new office in a city. Two lease options are available, each with a first cost, annual lease cost, and deposit-return estimates shown below:

	Location X	Location Y
First Cost (Rs.)	-150000	-190000
AOC (Rs.)	-35000	-32000
Deposit Return (Rs.)	10000	22000
Life (years)	6	9

Determine which lease option should be selected on the basis of a present worth comparison, if the MARR is 12% per year.

- (b) What do you mean by payback period? What are their significances and drawbacks? Find the payback periods of given cash flow:

Initial investment	: Rs. 25,000
Net annual revenue	: Rs. 8,000
Salvage value	: Rs. 5000
Useful life	: 5 years
MARR	: 12%

4+4

- 3(a) Three mutually exclusive alternatives are currently under consideration. Their respective costs and benefits are included in the table below. Each of the projects has a useful life of 25 years, and the nominal interest rate is 18% per year. Use IRR to recommend best alternative.

10

	Initial Investment (Rs.)	Annual O&M Cost (Rs.)	Salvage Value (Rs.)	Annual Benefits (Rs.)
A	85000	7500	12500	21500
B	100000	7250	17500	22650
C	120000	7000	20000	25000

- (b) List out the drawbacks of IRR method? How can we eliminate some of these drawbacks?

6

- 4(a) Suppose that Rs. 100000 is deposited in Bank Account at the end of each quarter over the next twenty years. What is the future worth at the end of 20 years when the interest rate is 12% compound (i) quarterly, (ii) monthly, (iii) continuously.

6

(3)

- (b) Find both type of B/C ratio using AW and FW formulation of the following project and determine whether the project is feasible or not? 5

Initial investment= Rs. 500000

Annual revenue= Rs. 80,000

Annual expenses= Rs. 15,000

Salvage value= Rs. 10,000

Useful life= 20 years

MARR= 10%

- (c) Consider the following accounting information for a computer system:

Cost basis, I_i = Rs. 10,000

Useful life, N_i = 5 years

Estimated salvage value= Rs. 778

Compute the annual depreciation allowances and the resulting book values using the double declining depreciation method. 5

	Alternatives	
	A	B
Capital Investment (Rs.)	3500	5000
Annual Revenue (Rs.)	1900	2500
Annual Expenses (Rs.)	645	1020
Useful life (yrs)	5	5
Salvage value (Rs.)	0	0

- 5(a) What shall be the demand if price is set to be Rs.75/kg? Use linear regress model. 6

S.No.	Price (Rs./kg)	Demand (Kg)
1	62	280
2	68	310
3	78	350
4	89	370
5	85	360
6	53	250
7	71	320
8	66	290
9	67	300

Contd. ...

(4)

- (b) Suppose that there are two alternative electric motor that provide 100 HP output:

Item	Alpha Motor	Beta Motor
Purchase Cost	Rs. 1250000	Rs. 1600000
Efficiency	74%	92%
O & M Cost	Rs. 50000 per year	Rs. 25000 per year
Life	10 years	10 years
Annual tax and insurance	1.5% of the investment	1.5% of the investment
MARR	15%	15%

- (i) How many hours per year would the motors have to be operated at full load for the annual cost to be equal?
Electricity cost= Rs. 5/kw.
- (ii) If annual operation hour is 600 hrs., which motor should be selected?
6. Write short notes on any FOUR: 4×4=16
- (a) VAT
 - (b) Recaptured depreciation
 - (c) Differed annuity
 - (d) Decision Tree
 - (e) Market Research



PURBANCHAL UNIVERSITY
2017

B.E. (Civil/Computer/Electronics & Comm.)/Sixth Semester/*Final*
Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG395MS: Engineering Economics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer FIVE questions.

1(a) Define cash flow. Explain different economic systems. 2+4

(b) Estimate the price of cement if demand is 10,000 bags, when the consumption pattern is shown below: 10

S.N.	Price (Rs. Per bag)	Demand (Bags)
1	700	1000
2	680	1200
3	590	2000
4	650	1500
5	730	800
6	620	1800
7	550	2500
8	530	3000
9	500	5000
10	570	2200

2(a) Differentiate prime cost from overhead cost. Explain about process costing. 6

(b) Perform sensitivity analysis by investigating its Aw over a range of $\pm 30\%$ changes in estimates for: 10

- | | |
|--------------------|---------------------------|
| (i) Investment | (ii) Annual net cash flow |
| (iii) Market value | (iv) Useful life |

Investment cost= Rs. 12,00,000

Annual revenue= Rs. 2,00,000

Annual expenses= Rs. 50,000

Market value= Rs. 1,50,000

Useful life= 6 years

MARR= 8%

Contd. ...

(2)

3(a) Describe Decision Tree and its use with an example.

6

(b) Use IRR method to select the better of two mutually exclusive investment options, given below:

10

	Project X	Project Y
Initial Investment (Rs.)	100,000	150,000
Annual Revenue (Rs.)	45,000	60,000
Annual Expenses (Rs.)	10,000	15,000
Salvage Value (Rs.)	8,000	12,000
Useful Life (years)	5	5

Take MARR= 10 % annually.

4(a) Evaluate whether the following project is feasible or not:

10

Year	Net Cash Flow (Rs.)
0	-55,000
1	-15,000
2	20,000
3	25,000
4	20,000
5	30,000

Use PW and AW methods for analysis. Take MARR= 10%/year.

(b) Shrawan wishes to take a loan of Rs. 1 million from a bank, for a period of 10 years. Should the bank forward the loan? What would be his monthly installment at an interest rate of 10% compounded monthly?

6

5(a) Explain about Taxation laws of Nepal.

4

(b) Engineering Projects A, B, C, D and E are being considered with cash flows as shown:

Particulars	Projects				
	A	B	C	D	E
Capital Investment (Rs.)	40000	25000	90000	75000	100000
Annual Revenue (Rs.)	10000	7000	18000	14000	20000
Market Value (Rs.)	4000	2500	9000	7500	10000
Projects A and B	Mutually Exclusive				
Project C	Contingent to B				
Project D	Contingent to A				
Project D and E	Mutually Exclusive				

Contd. ...

(3)

List all possible alternatives and select the best alternative using
PW method. Take MARR= 10%. 12

6. Writes short notes any FOUR: $4 \times 4 = 16$
- (a) Cost Variance Analysis
 - (b) Drawbacks of IRR
 - (c) Break-even Analysis
 - (d) Depreciation and Recaptured Depreciation
 - (e) Market Research
- ***

PURBANCHAL UNIVERSITY
2018

B.E. (Civil/Computer/E. & C.)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG395MS: Engineering Economics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

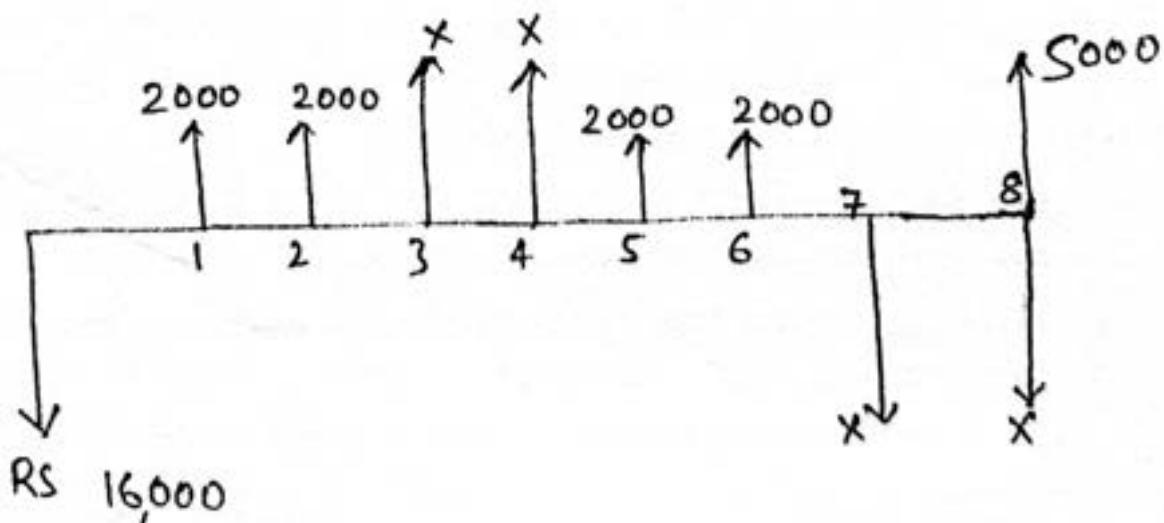
Answer FIVE questions.

5×16=80

- (a) Explain the principles of Engineering Economics. 4
- (b) Based on the following information, Calculate (a) total material cost variance, total wage variance. (c) variable overhead variance, and (d) fixed overhead variance. 12

Particulars	Standard	Actual
Product (units)	11,000	8,000
Direct Material (Kg)	55,000	61,250
Direct Material Cost (Rs.)	13,50,000	14,50,250
Direct Labor (Hrs)	1,00,500	68,250
Direct Labor Cost (Rs.)	1,27,50,000	85,25,000
Fixed Overhead (Rs.)	12,70,000	88,75,125
Variable Overhead (Rs.)	83,00,000	57,90,250

- 2(a) The following cash flow diagram has an internal rate of return of 20%. Compute the unknown value of x. 8



Contd. ...

(2)

- (b) Perform sensitivity analysis by investigating the annual worth of the following project over a range of 20% in
- Initial investment
 - Annual net revenue

Initial investment	: Rs. 6,00,000
Annual revenue	: Rs. 1,10,000
Annual expenses	: Rs. 10,000
Salvage value	: Rs. 8000
Useful life	: 15 years
MARR	: 10%

Also draw the Sensitivity Graph.

- 3(a) A government agency is considering four independent projects, each having 30 years projected useful lives. The nominal interest rate is 10% per year. Using the B/C ratio method; which of the projects shown below should be selected. Use any of OPW, FW or AW method.

Project	Initial Investment (\$)	Annual Cost (\$)	Annual Benefits (\$)
A	12000	1250	3250
B	20000	4500	8000
C	10000	750	1250
D	14000	1850	4050

- (b) Explain the time value of money?

- 4
4(a) A buildings priced at 1,00,00,000. If a down payment of 30,00,000 is made and a payment of 1,00,000 every month thereafter is required, how many months will it take to pay for the building? $I=12\%$ compound monthly.

- 10
(b) What are the drawbacks of IRR method? How does ERR method help to eliminate some of these drawbacks.

- 6
5(a) Consider two alternatives A & B. They have useful life of 4 and 8 year respectively. Their tabulated cash flow is shown in figure below. Suppose the expected period of required services for X & Y is only 8 years and $MARR=10\%$ per year. Show which alternative is more desirable based on the co-terminated assumptions.

8

12

4

10

6

12

(3)

Investment	Rs. 350000	Rs. 500000
Annual Revenues	Rs. 190000	Rs. 250000
Annual Cost	Rs. 64500	Rs. 138500
Useful Life	4 years	8 years
Salvage Value	Rs. 10000	Rs. 15000

- (b) What is a Decision Tree? Discuss its application in risk analysis. 4
6. Write short notes on any FOUR: $4 \times 4 = 16$
- ((a) Elements of cost
 - (b) Market Research Techniques
 - (c) Depreciation
 - (d) VAT
 - (e) Uniform series present worth factor.



PURBANCHAL UNIVERSITY

2019

B.E. (Civil/Computer/E. & C.)/Sixth Semester/Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

BEG395MS: Engineering Economics (New Course)

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer FIVE questions.

5×16=80

- 1(a) What are the different economics systems, explain. Differentiate between opportunity cost and sunk cost. 6
- (b) Based on the following information, Calculate (a) total material cost variance, (b) total wage variance, (c) variable overhead variance, and (d) fixed overhead variance. 10

Particulars	Standard	Actual
Product (units)	900	750
Direct Material (Kg)	4000	4625
Direct Material Cost (Rs.)	120000	135000
Direct Labor (Hrs)	9000	7650
Direct Labor Cost (Rs.)	1100000	602500
Fixed Overhead (Rs.)	1000000	559625
Variable Overhead (Rs.)	630000	419750

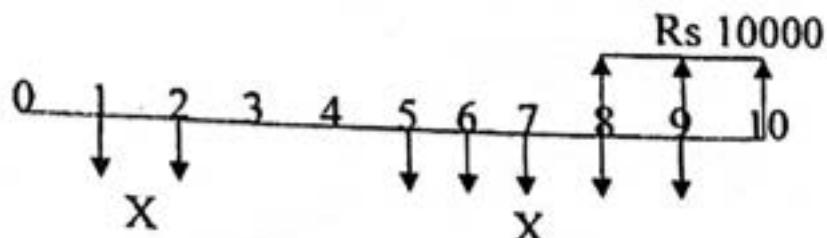
- 2(a) Consider two alternatives X and Y. They have useful life of 3 and 4 years respectively. Their tabulated cash flow is shown below. MARR = 15% per year. Show which alternative is more desirable using repeatability assumption. 12

Activities	Alternatives	
	X	Y
Initial investments (Rs.)	4000	6000
Annual revenue (Rs.)	1500	2000
Annual Expenses	500	700
Salvage value (Rs.)	1000	15000

Contd. ...

(2)

- (b) What are the parameters for sensitivity analysis? Explain the steps for sensitivity analysis.
- 3(a) A city government is considering two types of town dump sanitary systems. Design A requires an initial outlay of \$400,000, with annual operating and maintenance cost of \$50,000 for the next 15 years; Design B calls for an investment of \$300,000, with annual operating and maintenance cost of \$80,000 per year for the next 15 years; Design C, which requires an initial outlay of \$350,000 and annual O&M cost of \$65,000 for 15 years. Fe
collections from the residents would be \$85,000 per year. The interest rate is 8%, and no salvage value is associated with the either system. Using the benefit cost ratio (B/C); which system should be selected?
- (b) What are the drawbacks of IRR method? How does ERR method help to eliminate some of these drawbacks?
- 4(a) A man is planning to finance their 5 year old-sons. Money can be deposited at 8% compounded quarterly. What quarterly deposit must be made from the son's 5th birthday to his 18th birthday to provide \$50,000 on each birthday from the 18th to the 23rd.
- (b) Define pay pack period and minimum attractive rate of return. How does effective interest rate differ from nominal interest rate?
- 5(a) From the cash flow diagram, find the value of X that will establish the economic equivalence between the deposit series and the withdrawal series at an interest of 8%, compounded annually.



- (b) Two 100 HP motors are being considered for use. If power cost is \$0.10/Kw-hr. and interest rate is 12% per year, how many hours of operation per year are required to justify the purchase of Y brand motor? Which motor would you select if the motor is expected to operate 200 hrs per year.

Contd. ...

(3)

	X Brand	Y Brand
Purchase Price (\$)	1900	6200
Useful life. (year)	10	10
Annual maintenance expenses (\$)	170	310
Efficiency	80%	90%

6. Write short notes on any FOUR:

$4 \times 4 = 16$

- (a) Taxation system in Nepal
- (b) Demand analysis
- (c) Lifecycle Cost
- (d) Single payment compound amount factor
- (e) Depreciation

