Registration No.....

Bhartiya Skill Development University

School of General Education

B.Voc. Program, Summer Semester (2018-19)

I Semester, End-Semester Examination- December 2018

Course Code: GEN1101 **Time: 3 Hours**

Course Name: English Language & Comprehension **Max. Marks: 100**

Instructions: The question paper comprises three sections A, B & C. Marks allotted are mentioned against each section.

Section A: Attempt *all* questions.

Section B: Attempt any six questions

Section C: Attempt all questions.

Section-A **(2*10=20)**

Q1. Select the suitable article (a, an, the) and fill in the blanks: -

a) Udaipur is _____ big city.

b) I read_____ interesting story last evening.

Q2. State whether the following sentences are True or False: -

a) Miss Sullivan was strict but kind.

b) Rip Van Winkle lived in a small town in South America.

Q3. Choose the correct answer:

a) The poem "Stopping by Woods on a Snowy Evening" is written by: -

(i) Robert Snow

(ii) Robert Frost

(iii) Helen Keller

(iv) William Shakespeare

b) Helen Keller was born in: -

(i) Alabama

(ii) Ambala

(iii) Alambasa

(iv) Alamara

Q4. State the superlative degree of the following words: -

a) Good

b) Careful

Q5. Give one homophone for each of the following words: -

a) By
b) Ate

Q6. Arrange the jumbled words in a proper sentence: -

a) baby girl/a healthy/in a small town/in Alabama/ was born
b) in a small house/Velu lived/the sea/near

Q7. Match the following: -

a) Proper Noun	i) Mahatma Gandhi
b) Pronoun	ii) She

Q8. Identify the countable and uncountable nouns in the following words: -

a) Milk
b) Chair

Q9. Match the following: -

a) Disagreement	i) Have a good day!
b) Greeting	ii) I do not agree with you.

Q10. Fill in the blanks with the correct word from the given verbs in the brackets:-

a) Last year, I _____ for a holiday to Simla. (go/went)
b) The sun_____ in the East. (rise/rises)

Section B

(5*6=30)

Q11. Explain with reference to the context –

He gives his harness bells a shake
To ask if there is some mistake.
The only other sound's the sweep
Of easy wind and downy flake

Q12. Where did the following people live?

(a) Mowgli
(b) Velu
(c) Rip Van Winkle
(d) Helen Keller
(e) Owner of the woods

Q13. Was Rip liked by everyone? Why?

Q14. Write five utterances for Greeting.

Q15. Answer with reference to the context:

" Give the poor child what she wants."

Q16. What did Mowgli do during the day?

Q17. What did Rip do when he felt thirsty?

Q18. Why did Velu throw the small fish back into the sea?

Section C **(10*5=50)**

Q19. Write the summary of the poem "Stopping by Woods on a Snowy Evening".

Q20. Write a short introduction of yourself.

Q21. Write the summary of the story 'Rip Van Winkle'.

Q 22. Make sentences using the following words: -

(a) greedy

(b) clever

(c) surprise

(d) evening

(e) horse

(f) water

(g) angry

(h) bright

(i) thirsty

(j) fish

Q23. Read the passage carefully and answer the questions given below:

Padma Bhushan Award winner Dr Ramakant Panda is known as "the man with safest hands". A specialist in heart surgery, Dr Panda has performed over 10,000 bypass surgeries and 800 redo bypass. He is regarded as one of the most prolific surgeons in the world. More importantly, he has done more than 1500 high risk surgeries, which have offered new life to many patients who were considered "inoperable".

Born in Orissa at a place called Jaipur, Dr Panda's parents were landowners. He spent his childhood with his grandfather, a freedom fighter. His grandfather was the headmaster of a school and a strict disciplinarian. He used to insist that Panda and his cousin, who too lived with the grandfather, washed dishes after meals. He also made them wash their clothes. The grandpa's discipline had a tremendous influence on Panda and his cousin. Panda was topper at the All-India Institute of Medical Sciences (AIIMS). He did his post-graduation in surgery and heart surgery at AIIMS between 1980 and 1985. It was at AIIMS that the real grinding took place. He was always a

hardworking student, but the actual drive to excel and do better happened at AIIMS. Those were the toughest five years of his life. He often used to work for 18 hours a day.

i. What was Dr Ramakant Panda known as?

ii. What was Dr Panda a specialist in?

iii. How many high-risk surgeries did Dr Ramakant Panda perform?

iv. Name the place of birth of Dr Ramakant Panda.

v. With whom did Dr Ramakant Panda spend his childhood?

vi. Describe the nature of Dr Ramakant Panda's grandfather.

vii. Where did Dr Ramakant Panda do his post-graduation?

viii. What had a tremendous influence on Dr Ramakant Panda?

ix. Dr Panda worked for how many hours in a day?

x. Give a suitable title for this passage.

Answer - Key

Registration No.....

Bhartiya Skill Development University

School of General Education

B.Voc. Program, Summer Semester (2018-19)

I Semester, End-Semester Examination- December 2018

ANSWER KEY

Course Code: GEN1101 **Time: 3 Hours**

Course Name: English Language & Comprehension **Max. Marks: 100**

Instructions: The question paper comprises three sections A, B & C. Marks allotted are mentioned against each section.

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Section B: Attempt any six questions

Section C: Attempt all questions.

Section-A **(2*10=20)**

Ans1. a) a.
b) an

Ans2. a) True
b) False

Ans3. a) (ii) Robert Frost
b) (i) Alabama

Ans4. a) best
b) most careful

Ans5. a) buy/bye.
b) Eight

Ans6. a) A healthy baby girl was born in a small town in Alabama.
b) Velu lived in a small house near the sea.

Ans7. a) (i)
b) (ii)

Ans8. a) Uncountable
b) Countable

Ans9. a) (ii)
b) (i)

Ans10. a) went
b) rises

Section B

(5*6=30)

Ans11. Explain with reference to the context –

The horse shakes the bells on the neck. It is very quit.
There is only the sound of wind and snow.

Ans12. Where did the following live?

(a) Mowgli - Lived in a jungle.

(b) Velu - In a small house near the sea.

(c) Rip Van Winkle - In a village in North America.

(d) Helen Keller - In a small village in Alabama in North America.

(e) Owner of the woods –In the village.

Ans13. Yes. Simple, Kind, Hearted man, Tell stories.

Ans14. Individual answers.

Ans15. From Helen Keller. Said by Helen's father to Helen's mother. When Helen cried all the time.

Ans16. Slept, ate, slept again.

Ans17. Miss Sullivan strict, but kind.

Ans18. Because he wanted to catch bigger fish.

Section C

(10*5=50)

Ans19.

The poet is going in the forest. He is on a horse. It is evening time and snowing. The poet stops for some time, but the owner of the forest does not see them, because his house is in the village.

Poet says that the horse must be thinking why they have stopped when there is no house.

The horse shakes the bells on the neck. It is very quiet. There is only the sound of wind and snow.

The poet says that forest is beautiful, but he has to travel a long time before resting.

Ans 20. Name, education, family, hobbies.

Ans 21. Rip Van Winkle is a good but lazy man. He went to Catskill Mountains. He drank a liquid and slept for 20 years. When he woke up he could not recognize anybody. His daughter took him home and he lived happily.

Ans 22. Make sentences using the following words: -

(a) greedy - My dog is very greedy.

(b) clever - The clever child secured full marks.

(c) surprise - I was surprised to see my marks.

(d) evening - I plan to go for shopping today evening.

(e) horse - A horse has four legs.

(f) water - Could I get a glass of water please?

(g) angry - The angry farmer threw stones at the birds.

(h) bright - Rohan loves to play with his bright red ball.

(i) thirsty - I felt very thirsty after playing football.

(j) fish _ I have a pet fish.

Ans 23. Read the passage carefully and answer the questions given below:

i. The man with the safest hands.

ii. Heart surgery.

iii. More than 1500.

iv. Jaipur, Orissa.

v. Grandfather.

vi. Strict.

vii. AIIMS

viii. Grandpa's discipline

ix. 18 hours

x. Famous Heart surgeon.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of General Education

Session: 2018-19 (Summer Semester)

B. Voc. Program, 1st Semester (2018-19)

End-Sem. Examination

Course Code: GEN 1103 **Time: 3 Hours**

Course Name: Applied Mathematics **Max. Marks: 100**

Instructions:

1. Calculator is strictly prohibited.
2. Missing data if any can be suitably assumed.

Section – A

20×01 = 20 Marks

Q1. Which of the following collection are not set?

(A) Collection of all even integers. (B) Collection of most horror movies.

(C) Collection of all boys in your class. (D) Collection of all natural numbers.

Q2. The symbol of empty set is

(A) E (B) $\{\phi\}$

(C) ϕ (D) ψ

Q3. If A = {1, 3, 7, 9} and B = {2, 3, 6, 7}, then A-B is

(A) {2, 6} (B) {1, 9}

(B) {1, 6} (D) {1, 3, 7, 9}

Q4. If A = {1, 5, 6, 8} and B = {2, 4, 6, 9}, then $A \cap B$ is

(A) {1, 5, 8} (B) {4, 9}

(C) {6} (D) {8, 9}

Q5. Which of the following number is not the prime number?

(A) 2 (B) 21

(C) 23 (D) 17

Q6. Arithmetic Mean (A.M.) between $(x+y)^2$ and $(x-y)^2$ is

(A) 2 (B) x^2+y^2

(C) $(x+y)^2$ (D) $(x-y)^2$

Q7. The 4th term of $T_n = 3^{n+1}$ is

(A) 81 (B) 789

(C) 243 (D) 9

Q8. If 2, 5, 8, 11,..... is a sequence, then what is the common difference (d)?

(A) 2 (B) 11

(C) 8 (D) 3

Q9. What is the Geometric Mean (G.M) between 1 and 25?

(A) 1 (B)13

(C) 26 (D) 5

Q10. $\int \log x \, dx =$

(A) $\frac{1}{x} + c$ (B) $x \log x - x + c$

(C) $\log x + c$ (D)1

Q11. $\frac{d}{dx}(3x^4) =$

(A) $12x^4$ (B) $12x^3$

(C) $4x^3$ (D) None of the above

Q12. $\lim_{x \to 2} \frac{x^2 - 4}{x - 2} =$

(A) 0 (B) 2

(C) 1 (D) 4

Q13. $\frac{d}{dx}(3a) =$

(A) 3 (B) a

(C) 0 (D) 1

Q14. A symbol which can take different values during the operations is called…

(A) Variable (B) Constant

(C) Function (D) None of the above

Q15. $\lim_{x \to 1} x^3 + 3x =$

(A) 3 (B) 1

(C) 2 (D) 4

Q16. $\int 2 \, dx =$

(A) $x + c$ (B) $2x + c$

(C) 0 (D) $x^2 + c$

Q17. $\frac{d}{dx}(e^x) =$

(A) $e^x \log a$ (B) e^x

(C) e (D) x

Q18. What is the range of the data 3, 8, 9, 1, 7, 12, 18

(A) 3 (B) 17

(C) 9 (D) 0

Q19. When the number of observations are odd then the median is

(A) $\left(\frac{n}{2}\right)^{th}$ (B) $\left(\frac{n+1}{2}\right)^{th}$

(C) $\left(\frac{n}{2}+1\right)^{th}$ (D) $\left(\frac{2}{n}\right)^{th}$

Q20. In a cricket match, a batsman hits a boundary 5 times out of 20 balls. What is the probability that he hit a boundary?

(A) $\frac{2}{20}$ (B) $\frac{1}{4}$

(C) $\frac{4}{20}$ (D) 1

Section – B

06×05 = 30 Marks

Attempt any 06 questions (21-28):

Q21. If A = {3, 5, 7, 9, 11}, B = {7, 9, 11, 13}, C = {11, 13, 15} and D = {15, 17} then find

(i) $A \cap B$

(ii) $A \cup C$

(iii) A – B

(iv) B – C

(v) $B \cap (C \cap D)$

Q22. Write the following sets into set-builder form:

(i) {3, 6, 9, 12}

(ii) {2, 4, 8, 16, 32}

(iii) {5, 25, 125, 625}

(iv) {2, 4, 6, …}

(v) {1, 2, 3, 6, 7, 14, 21, 42}

Q23. If 2nd term of an A.P is $7\frac{3}{4}$, 31st term is $\frac{1}{2}$ and last term is $-6\frac{1}{2}$. Find the first term and the number of terms.

Q24. Evaluate the following limits:

(i) $\lim_{x\to 1} \dfrac{x-1}{\sqrt{5x-4}-\sqrt{x}}$

(ii) $\lim_{x\to 2} \dfrac{x^2-3x+2}{x^2-6x+8}$

Q25. If $y = \dfrac{x^4+8x^3+5x}{\sin x}$, then find $\dfrac{dy}{dx}$.

Q26. Evaluate $\int \dfrac{4x+10}{x^2+5x-1}dx$.

Q27. **(a)** If $y = e^{2x}\sin x$, then find $\dfrac{dy}{dx}$.

(b) Evaluate $\int \dfrac{x^2+2x}{x^2}dx$.

Q28. In a mathematics test given to 15 students, the following marks (out of 100) are recorded:

41, 39, 48, 52, 46, 62, 54, 40, 96, 52, 98, 40, 42, 52, 60

Find the mean, median and mode of this data.

Section – C

05×10 = 50 Marks

Q29. **(a)** If U = {1, 2, 3, 4, 5, 6}, A = {2, 3} and B = {3, 4, 5} then verify that

(i) $(A\cup B)' = (A'\cap B')$

(ii) $(A\cap B)' = (A'\cup B')$

(b) Write the power set of following sets:

(i) A = {3, {5, 6}, 7, 9}

(ii) B = {*a*, *b*, *c*}

Q30. **(a)** Insert **five** arithmetic mean (A.M) between 8 and 26.

(b) If (*k*-1) is the geometric mean (G.M) between (*k*-2) and (*k*+1), then find the value of *k*.

Q31. Evaluate:

(a) $\int x^2\cos^2 x\,dx$.

(b) $\int xe^x\,dx$.

Q32. Find $\frac{dy}{dx}$:

(i) $y = \log\left(ax^2 + 6x\right)$

(ii) $y = e^{3x}(a + b\cos x)$.

Q33. An insurance company selected 2000 drivers at random in a particular city to find a relationship between age and accidents. The data obtained are given in the following table:

Age of drivers (in years)	Accidents in one year				
	0	1	2	3	over 3
18-29	440	160	110	61	35
30-50	505	125	60	22	18
Above 50	360	45	35	15	9

Find the probabilities of the following events for a driver chosen at random from the city:

(i) Being 18-29 years of age and having exactly 3 accidents in one year.

(ii) Being 30-50 years of age and having one or more accidents in a year.

(iii) Having no accidents in one year.

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2018-19
(summer)

Answer Key

B.Voc 1st Sem (End term Exam)

Course code:- UEN 1103

Course Name: Applied Mathematics

Q.1 (B)
Q.2 (C)
Q.3 (B)
Q.4 (C)
Q.5 (B)
Q.6 (B)
Q.7 (C)
Q.8 (D)
Q.9 (D)
Q.10 (B)
Q.11 (B)
Q.12 (D)
Q.13 (C)
Q.14 (A)
Q.15 (D)
Q.16 (B)
Q.17 (B)
Q.18 (B)
Q.19 (B)
Q.20 (B)

See B

Q.21 given $A = \{3, 5, 7, 9, 11\}$

$B = \{7, 9, 11, 13\}$

$C = \{11, 13, 15\}$

$D = \{15, 17\}$

(i) $A \cap B = \{7, 9, 11\}$

(ii) $A \cup C = \{3, 5, 7, 9, 11, 13, 15\}$

(iii) $A - B = \{3, 5\}$

(iv) $B - C = \{7, 9\}$

(v) $B \cap (C \cap D) = \phi$

Q.22 (i) $A = \{x = 3n ; n \in N, 1 \le n \le 4\}$

(ii) $A = \{x = 2^n ; n \in N, 1 \le n \le 5\}$

(iii) $A = \{x = 5^n : n \in N, 1 \le n \le 4\}$

(iv) $A = \{x = n ; n \in N, N$ is even natural no.$\}$

(v) $A = \{x = n : n \in N,$ where n is divided by $42\}$.

Q.23 given $T_2 = 7\frac{3}{4} \Rightarrow a+d = \frac{31}{4}$ — ①

$T_{31} = \frac{1}{2} \Rightarrow a+30d = \frac{1}{2}$ — ②

from ① and ② we have.

$$29d = \frac{1}{2} - \frac{31}{4} = -\frac{29}{4} \Rightarrow d = -\frac{1}{4}$$

from ① we have

$$a - \frac{1}{4} = \frac{31}{4} \Rightarrow a = 8$$

also $a + (n-1)d = -\frac{13}{2}$

$$8 + (n-1)\left(-\frac{1}{4}\right) = -\frac{13}{2}$$

$$8 - \frac{n}{4} + \frac{1}{4} = -\frac{13}{2}$$

$$32 - n + 1 = -26$$

$$n = 59$$

Q. 24

(i) given $\lim_{x\to 1} \frac{x-1}{\sqrt{5x-4}-\sqrt{x}} \times \frac{\sqrt{5x-4}+\sqrt{x}}{\sqrt{5x-4}+\sqrt{x}}$

$= \lim_{x\to 1} \frac{(x-1)(\sqrt{5x-4}+\sqrt{x})}{5x-4-x}$

$= \lim_{x\to 1} \frac{(x-1)(\sqrt{5x-4}+\sqrt{x})}{4(x-1)}$

$= \lim_{x\to 1} \frac{\sqrt{5x-4}+\sqrt{x}}{4} = \frac{1+1}{4} = \frac{1}{2}$

(ii) $\lim_{x\to 2} \frac{x^2-3x+2}{x^2-6x+8}$

$\Rightarrow \lim_{x\to 2} \frac{x^2-2x-x+2}{x^2-4x-2x+8}$

$\Rightarrow \lim_{x\to 2} \frac{x(x-2)-1(x-2)}{x(x-4)-2(x-4)}$

$\Rightarrow \lim_{x\to 2} \frac{(x-2)(x-1)}{(x-2)(x-4)} = \frac{2-1}{2-4} = -\frac{1}{2}$

Q 25 given $y = \frac{x^4+8x^3+5x}{\sin x}$

$\frac{dy}{dx} = \frac{\sin x \frac{d}{dx}(x^4+8x^3+5x) - (x^4+8x^3+5x)\frac{d}{dx}(\sin x)}{\sin^2 x}$

$= \frac{\sin x(4x^3+24x^2+5) - (x^4+8x^3+5x)(\cos x)}{\sin^2 x}$

Q.26 given $I = \int \frac{4x+10}{x^2+5x-1}\,dx$

$$\int \frac{2(2x+5)}{x^2+5x-1}\,dx \quad \text{— (1)}$$

let $x^2+5x-1 = t$

$(2x+5)\,dx = dt$

from (1) we have

$$= \int \frac{2}{t}\,dt = 2\log t + c$$

$$= 2\log(x^2+5x-1) + c$$

Q.27 (a) $y = e^{2x}\sin x$

$$\frac{dy}{dx} = e^{2x}\frac{d}{dx}(\sin x) + (\sin x)\frac{d}{dx}e^{2x}$$

$$= e^{2x}\cos x + \sin x \cdot 2 \cdot e^{2x}$$

$$= e^{2x}(\cos x + 2\sin x)$$

(b) $\int \frac{x^2+2x}{x^2}\,dx$

$$= \int \left(1 + \frac{2}{x}\right)dx = x + 2\log x + c$$

Q. 28

given data

41, 39, 48, 52, 46, 62, 54, 40, 96, 52, 98
40, 42, 52, 60.

arrange the given data in ascending order.

39, 40, 40, 41, 42, 46, 48, (52), 52, 52, 54, 60, 62, 96, 98

Mean of the data

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} = \frac{822}{15} = 54.8$$

Median of the data:- $\left(\frac{n+1}{2}\right)^{th}$

$$= \frac{15+1}{2} = 8^{th}$$

$$= 52.$$

Mode of the data:- 52

see. c

Q. 29

(a) given $U = \{1, 2, 3, 4, 5, 6\}$

$A = \{2, 3\}$

$B = \{3, 4, 5\}$

(i) $(A \cup B)' = A' \cap B'$

L.H.S.

$A \cup B = \{2, 3, 4, 5\}$

$(A \cup B)' = U - (A \cup B) = \{1, 6\}$

R.H.S. $A' \cap B'$

$A' = U - A$

$= \{1, 4, 5, 6\}$

$B' = U - B$

$= \{1, 2, 6\}$

$A' \cap B' = \{1, 6\}$

Hence $(A \cup B)' = A' \cap B'$

(ii) $(A \cap B)' = A' \cup B'$

L.H.S

$A \cap B = \{3\}$

$(A \cap B)' = U - (A \cap B)$

$= \{1, 2, 4, 5, 6\}$

R.H.S.

$A' \cup B'$

$A' = \{1, 4, 5, 6\}$

$B' = \{1, 2, 6\}$

$A' \cup B' = \{1, 2, 4, 5, 6\}$

Hence $(A \cap B)' = A' \cup B'$

(b) (i) $A = \{3, \{5, 6\}, 7, 9\}$

$n(A) = 2^m = 2^4 = 16$

$P(A) = \{\phi, \{3\}, \{\{5, 6\}\}, \{7\}, \{9\}, \{3, \{5, 6\}\}, \{3, 7\}, \{3, 9\}, \{\{5, 6\}, 7\}, \{\{5, 6\}, 9\}, \{7, 9\}, \{3, \{5, 6\}, 7, 9\}, \{3, \{5, 6\}, 7\}, \{3, \{5, 6\}, 9\}, \{3, 7, 9\}, \{\{5, 6\}, 7, 9\}\}$

(ii) $B = \{a, b, c\}$

$n P(B) = 2^m = 2^3 = 8$

$P(B) = \{\phi, \{a\}, \{b\}, \{c\}, \{a, b\}, \{b, c\}, \{c, a\}, \{a, b, c\}\}$

Q.30 (a) Let A_1, A_2, A_3, A_4, A_5 are five arithmatic mean between 8 and 26.

$\therefore$ $8, A_1, A_2, A_3, A_4, A_5, 26.$

$\therefore$ $T_7 = a + 6d = 26$

$\Rightarrow 8 + 6d = 26$

$6d = 26 - 8 = 18$

$d = 3$

$A_1 = a + d = 8 + 3 = 11$

$A_2 = a + 2d = 8 + 6 = 14$

$A_3 = A + 3d = 8 + 9 = 17$

$A_4 = A + 4d = 8 + 12 = 20$

$A_5 = A + 5d = 8 + 15 = 23$

(b) given that $(K-1)$ is the GM between $(K-2)$ and $(K+1)$, Hence $GM = \sqrt{ab}$

$(K-1) = \sqrt{(K-2)(K+1)}$

$(K-1)^2 = (K-2)(K+1)$

$K^2 + 1 - 2K = K^2 + K - 2K - 2$

$1 = K - 2$

$K = 3$ Ans

Q.3) (a) $\int x^2 \cos^2 x \, dx$

$= \int x^2 \left(\frac{1+\cos 2x}{2}\right) dx$

$= \frac{1}{2}\left[\int x^2 \, dx + \int x^2 \cdot \cos 2x \, dx\right]$

$= \frac{1}{2}\left[\frac{x^3}{3} + x^2 \int \cos 2x \, dx - \int \left\{\int \cos 2x \, dx \cdot \frac{d}{dx}(x^2)\right\} dx\right]$

$= \frac{1}{6}x^3 + \frac{1}{2}x^2 \cdot \frac{\sin 2x}{2} - \frac{1}{2}\int \frac{\sin 2x}{2} \cdot 2x \, dx$

$= \frac{x^3}{6} + \frac{1}{4}x^2 \sin 2x - \frac{1}{2}\int x \cdot \sin 2x \, dx$

$= \frac{x^3}{6} + \frac{1}{4}x^2 \sin 2x - \frac{1}{2}\left[x \int \sin 2x - \int \left\{\int \sin 2x \, dx \cdot \frac{d}{dx}(x)\right\} dx\right]$

$= \frac{x^3}{6} + \frac{1}{4}x^2 \sin 2x + \frac{x}{2}\cos 2x - \frac{1}{2}\int \frac{\cos 2x}{2} \, dx$

$= \frac{x^3}{6} + \frac{1}{4}x^2 \sin 2x + \frac{x}{2}\cos 2x - \frac{\sin 2x}{8} + C$

(b) $\int x e^x \, dx$

$= x \int e^x - \int \left\{\int e^x \cdot \frac{d}{dx}(x)\right\} dx$

$= xe^x - \int e^x \, dx$

$= xe^x - e^x + C.$

Q. 32

(i) $y = \log(ax^2 + 6x)$

$$\frac{dy}{dx} = \frac{1}{ax^2+6x} \cdot 2ax + 6$$

$$\frac{dy}{dx} = \frac{2ax+6}{ax^2+6x}$$

(ii) $y = e^{3x}(a + b\cos x)$

$$\frac{dy}{dx} = e^{3x}\frac{d}{dx}(a+b\cos x) + (a+b\cos x)\frac{d}{dx}e^{3x}$$

$$= e^{3x}(-b\sin x) + (a+b\cos x)\, e^{3x} \cdot 3$$

$$\frac{dy}{dx} = e^{3x}\left[3a + 3b\cos x - b\sin x\right]$$

Q.33.

(i) 18–29 years, having exactly 3 accidents

$$P(E) = \frac{61}{2000} = 0.0305$$

(ii) 30–50, having one or more accidents

$$P(E) = \frac{125+60+22+18}{2000} = 0.1125$$

(iii) no accident in one year.

$$P(E) = \frac{440+505+360}{2000} = 0.6525$$

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of General Education

Session: 2018-19 (Summer Semester)

B. Voc. Program, 1st Semester (2018-19)

End-Sem. Examination

Course Code: GEN 1104 **Time: 3 Hours**

Course Name: Elementary Mathematics **Max. Marks: 100**

Instructions:

1. Calculator is strictly prohibited.
2. Missing data if any can be suitably assumed.

Section – A

20×01 = 20 Marks

Q1. How many meters are there in 1 kilometer?

(A) 1000 (B) 0.01

(C) 0.001 (D) 100

Q2. The sum of complementary angles is:

(A) 180^0 (B) 360^0

(C) 90^0 (D) 125^0

Q3. 1010 in hexadecimal is written as:

(A) D (B) A

(C) S (D) E

Q4. What is the value of sin45°?

(A) 1/2 (B) $1/\sqrt{5}$

(C) 3/4 (D) $1/\sqrt{2}$

Q5. Convert 45 mm into meters:

(A) 0.45 (B) 0.0045

(C) 0.045 (D) 450

Q6. 11 in decimal number is written as:

(A) 14 (B) 30

(C) 3 (D) 12

Q7. Number which occurs most frequently in a set of numbers is

(A) mode (B) mean

(C) median (D) None of these

Q8. How many seconds are there in one hour?

(A) 360 (B) 3600

(C) 36000 (D) 60

Q9. What is the mode of the following data?

1,2,2,2,2,6,6,6,6,6,6,6,4

(A) 2
(B) 6
(C) 4
(D) 1

Q10. What does the median of the data signify?

(A) Mid-value
(B) Extreme value
(C) Average Value
(D) None of these

Q11. The sum of linear pair is:

(A) 180^0
(B) 125^0
(C) 90^0
(D) 0^0

Q12. How many years in 30 months?

(A) 1.5
(B) 2
(C) 3
(D) 4

Q13. How many centimeters in 2 m 25 cm?

(A) 225
(B) 2.35
(C) 235
(D) 2.25

Q14. The area of rectangle is:

(A) b×h
(B) 2 (l+b)
(C) l×b
(D) l+b

Q15. How many minutes are there in 6 hours?

(A) 3600
(B) 60
(C) 360
(D) 600

Q16. Radius of a circle of diameter 12 cm is:

(A) 3 cm
(B) 4 cm
(C) 6 cm
(D) 1.2 cm

Q17. Angle which is equal to 90^0 is classified as:

(A) Acute angle
(B) Right angle
(C) Obtuse angle
(D) None of these

Q18. The origin point in a graph is:

(A) (0,0)
(B) (0,1)
(C) (1,0)
(D) (1,1)

Q19. Write 12 in binary form:

(A) 100
(B) 111
(C) 1100
(D) 1111

Q20. The outer boundary of an object is known as:

(A) Area (B) Perimeter

(C) Outline (D) None of these

Section – B

06×05 = 30 Marks

Attempt any 06 questions (21-28):

Q21. Find the value of

(i) $\sin 30^0 + \cos 30^0$

(ii) $\sin 45^0 \cos 45^0$

(iii) $\sin 90^0 \cos 90^0 + \cos 0^0 \sin 0^0$

(iv) $2\sin 30^0$

(v) $2\cos 30^0 + 2\sin 30^0$

Q22. If two complementary angles are in the ratio 8:7. Find the angles.

Q23. If the radius of circle is 5 cm. Then find its area and circumference.

Q24. If the cost of 3 cm of rod is Rs. 108. Find the cost of 12 cm of rod.

Q25. Convert:

(i) 2hr 6 min = _____ min

(ii) 12 min = _____ sec

(iii) 60 min = _____ hr

(iv) 20 min = _____ sec

(v) 3 hr = _____ sec

Q26. If a right circular cone has radius 4 cm and slant height 5 cm, then what is its volume?

Q27. Ram walked 4 m west and 5 m south. Calculate how far he is from his starting point?

Q28. Write cosA and tanA in terms of sinA.

Section – C

05×10 = 50 Marks

Q29. **(a)** Convert binary numbers into decimal numbers:

(i) 1111_2

(ii) 111001_2

(b) Convert binary numbers into hexadecimal numbers:

(i) 1100111111_2

(ii) 110011_2

(c) Convert decimal numbers into binary numbers:

(i) 168_{10}

(ii) 345_{10}

(d) Convert hexadecimal numbers into binary numbers:

(i) $2B_{16}$

(ii) 234_{16}

Q30. If tan A = ¾. Find other trigonometric ratios of angle A

Q31. In triangle ABC right angled at B, AB = 24 cm and BC = 7 cm. Find AC.

Q32. (a) If one of the supplementary angle is 125°. Find the measure of another angle.

(b) If two angles of a triangle is 60° each. Find the measure of third angle.

Q33. Find the mean, median and mode of the set of ages in the table below:

Age (years)	Frequency
10	0
11	8
12	3
13	2
14	7

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Summer 2018-19

Answer Key

B.Voc. I^st sem (End Sem exam)

Course code :- UEN 1104

Course Name :- Elementary Mathematics

Q.1 (A)
Q.2 (C)
Q.3 (B)
Q.4 (D)
Q.5 (C)
Q.6 (C)
Q.7 (A)
Q.8 (B)
Q.9 (B)
Q.10 (A)
Q.11 (A)
Q.12 (A)
Q.13 (A)
Q.14 (C)
Q.15 (C)
Q.16 (C)
Q.17 (B)
Q.18 (A)
Q.19 (C)
Q.20 (B)

Sec. B

Q.21 (i) $\sin 30^\circ + \cos 30^\circ$

$$= \frac{1}{2} + \frac{\sqrt{3}}{2} = \frac{1+\sqrt{3}}{2}$$

(ii) $\sin 45^\circ \cos 45^\circ$

$$= \frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{2}} = \frac{1}{2}$$

(iii) $\sin 90^\circ \cos 90^\circ + \cos 90^\circ \sin 0^\circ$

$$= 1 \times 0 + 1 \times 0 = 0$$

(iv) $2\sin 30^\circ = 2 \times \frac{1}{2} = 1$

(v) $2\cos 30^\circ + 2\sin 30^\circ = 2 \times \frac{\sqrt{3}}{2} + 2 \times \frac{1}{2} = 1+\sqrt{3}$

Q.22 x and y are two complementary angles.

$\therefore x + y = 90^\circ$

also we have

Let us assum y is the bigger angle

y would equal to $8:7\,x$

$$x + \frac{8}{7}x = 90$$

$$\frac{15}{7}x = 90^\circ \Rightarrow x = 42.$$

$$42 + y = 90^\circ$$

$$y = \underline{48}$$

Q.23 Radius of circle $= 5\,cm$

$$\text{Area} = \pi r^2$$

$$= \frac{22}{7} \times 5 \times 5 = 78.57\ cm^2.$$

$$\text{circumference} = 2\pi r$$

$$= 2 \times \frac{22}{7} \times 5 = 31.42.$$

Q.24 Cost of 3cm of Rod is 108 ₹.

" 1 cm " " $\frac{108}{3} = 36$ ₹

" 12 cm of Rod is $= 36 \times 12$

$= 432$ ₹

Q.25

(i) 126 min

(ii) 720 sec.

(iii) 1 hr

(iv) 1200 sec.

(v) 10800 sec.

Q.26 given Radius (r) = 4 cm

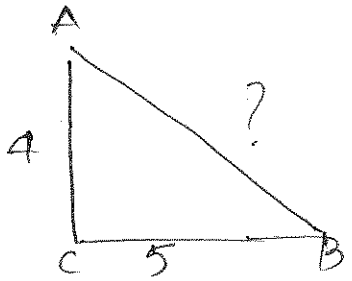
slant height (l) = 5 cm

then the volume $V = \frac{1}{3}\pi r^2 \sqrt{l^2 - r^2}$

$= \frac{1}{3}\frac{22}{7} \times 16 \sqrt{25 - 16}$

$= 50.27.$

Q.27



$AB = \sqrt{AC^2 + BC^2}$

$= \sqrt{16+25} = \sqrt{41} = 6.403$ m.

Q.28 $\cos A = \sqrt{1 - \sin^2 A}$

$\tan A = \frac{\sin A}{\cos A} = \frac{\sin A}{\sqrt{1 - \sin^2 A}}$

sec-C

Q.29 (a)

(i) $1111 = (1\times2^3)+(1\times2^2)+(1\times2^1)+(1\times2^0) = 15$

(ii) $111001 = (1\times2^5)+(1\times2^4)+(1\times2^3)+(0\times2^2)+(0\times2^1)+(1\times2^0) = 57$

(b)

(i) $1100111111 = 33F$

(ii) $110011 = 33$.

(c)

(i) $168 = 10101000$

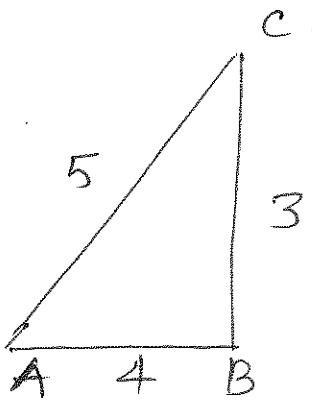
(ii) $315 = 100111001$

(D)

(i) $2B = 101011$

(ii) $234 = 11101010$

Q.30 given $\tan A = \frac{3}{4}$



$$\tan A = \frac{BC}{AB} = \frac{3}{4}$$

$$AC^2 = AB^2 + BC^2$$

$$AC = \sqrt{16+9} = 5$$

$$\sin A = \frac{BC}{AC} = \frac{3}{5}$$

$$\cos A = \frac{AB}{AC} = \frac{4}{5}$$

$$\cot A = \frac{1}{\tan A} = \frac{4}{3}$$

$$\operatorname{cosec} A = \frac{1}{\sin A} = \frac{5}{3}$$

$$\sec A = \frac{1}{\cos A} = \frac{5}{4}.$$

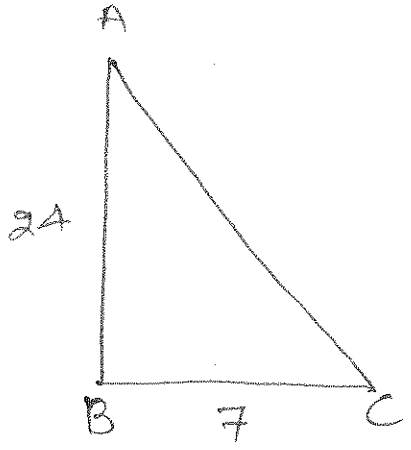
Q.31 given $AB = 24$ cm
$BC = 7$ cm.

$AC^2 = AB^2 + BC^2$

$= 576 + 49$

$AC = \sqrt{625}$

$AC = 25$ cm.



Q.32 (a) let that angle is x.

given $x + 125 = 180°$

$x = 180 - 125 = 55°$

(b) given let the third angle is z.

$x + y + z = 180°$

$60° + 60° + z = 180$

$z = 180 - 120 = 60°$

Q.33

mean $\bar{x} = \dfrac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \dfrac{11\times8 + 12\times3 + 13\times2 + 14\times7}{20}$

$= \dfrac{88 + 36 + 26 + 98}{20}$

$= 12.4.$

median:-

11, 11, 11, 11, 11, 11, 11, 11, 12, (12), (12), 13, 13,
14, 14, 14, 14, 14, 14, 14, 14

$\left(\frac{n}{2}\right)^{th}$ and $\left(\frac{n}{2}+1\right)^{th} = \frac{20}{2}$ and $\frac{20}{2}+1$
(10, 11) numbers

median is $\dfrac{12+12}{2} = 12.$

Mode:- most frequent no. is = 11