2209H010

BACHELOR OF VOCATION

Public Services

Subject: Mathematics and Reasoning-II

Subject Code: MAR601

Semester: Third

September 2022

Theory (External): 70 Marks

Time: 03 Hours

Instructions to the Students

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 2 marks.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 10 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number

SECTION –A (SHORT/OBJECTIVE TYPE QUESTIONS)
(10x2=20 Marks)

A. A 150 m long train is running at a uniform speed of 90km/hr. The time taken by the train to cross a pole is

(a) 3 sec.
(b) 4 sec.
(c) 6 sec.
(d) 9 sec.

B. A man's speed with the current is 15 km/hr. and the speed of the current is 2.5 km/hr. The man's speed against the current is

(a) 5 km/hr.
(b) 10 km/hr.
(c) 12.5 km/hr.
(d) 14.5 km/hr.

C. Let A can do a work on 10 days and B can do that work in 5 days. If they work together on it for 2 days, then the fraction of remaining work is

(a) $\frac{2}{5}$
(b) $\frac{3}{5}$
(c) $\frac{4}{5}$
(d) $\frac{1}{5}$

D. Find the LCM of $3xy$ and $7y^2z$

(a) $21xy$
(b) $21xy^2$
(c) $21xz$
(d) $21xy^2z$

E. Simplify $\sqrt{\frac{12}{121}}\,(5+\sqrt{3})(5-\sqrt{3})$

(a) $2\sqrt{3}$
(b) $4\sqrt{3}$

(c) $\sqrt{3}$

(d) $\sqrt{\frac{25}{11}}$

F. If × means "divided by", then choose the correct option

(a) $0 \times 36 = 36$

(b) $99 \times 1 = 1$

(c) $100 \times 100 = 1$

(d) $40 \times 2 = 80$

G. Identify the figure that completes the pattern

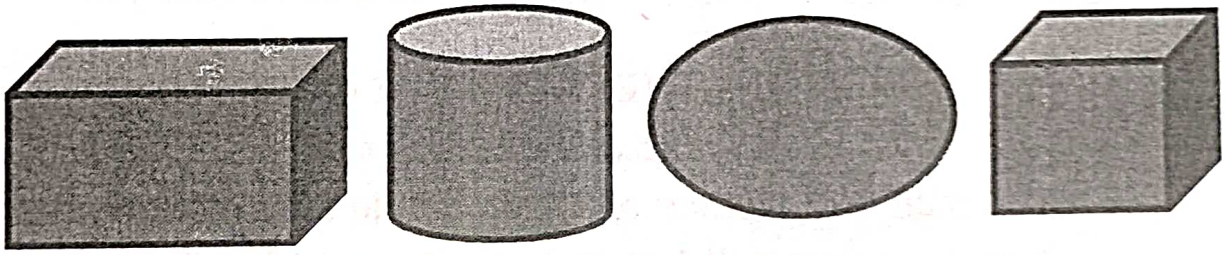
(a) (1)

(b) (2)

(c) (3)

(d) (4)

H.



Which of the following shape is different from the others?

(a) First shape

(b) Second shape

(c) Third shape

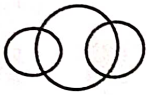
(d) Fourth shape

I. One morning, Arun started to walk towards sun. After walking some distance, he turned to right and then again after walking some distance, he turned left. Which direction he is facing now?

(a) East
(b) West
(c) North
(d) South

J. Which of the following Venn diagram indicates the best relation between travellers, bus and train?

(a) 

(b) 

(c) 

(d) 

SECTION –B (ESSAY TYPE QUESTIONS)
(5x10=50 Marks)

1. If 1 man or 2 women or 3 kids can do a bit of work in 44 days. In how long time will 1 man, 1 woman and 1 kid finish that work?
2. A pipe can fill a tank in 16 minutes but due to a leak at the bottom of the tank, 1/5 of the water filled by the pipe, leaks out. Find the time in which the tank is filled.
3. Four electronic devices make a beep after duration of 30 minutes, 1 hour, 3/2 hours and 1 hour 45 min. respectively. If all the devices beeped together at 12 noon at what time will they beep together again?

4. Two trains are running in opposite directions with the same speed. If the length of each train is 120 metres and they cross each other in 12 seconds, then find the speed of each train in km/hr.

5. If $\frac{a}{b} = \frac{2}{3}$ then find the value of $\frac{3a+5b}{3a-5b}$

6. If A $ B means A is neither greater than nor equal to B.
   A © B means A is neither lesser than nor equal to B.
   A @ B means A is not greater than B.
   A * B means A is not lesser than B.
   A # B means A is neither greater than nor lesser than B.
   and
   Statements: C * D, D @ F, F © G, G $ H

   Conclusions: I. C © F
   II. H © F
   III. G $ D
   IV. D $ H
   find which of the conclusions can be drawn from the given statements?
7. A given company has 1500 employees. Of those employees, 800 are computer science majors. 25% of those computer science majors are also mathematics majors. That group of computer science/math dual majors makes up one third of the total mathematics majors. How many employees have majors other than computer science and mathematics?
8. Simplify: $197 - [1/9\{42 + (56 - \overline{8 + 9})\} + 108]$

END OF PAPER