

## JR. DIVISIONAL ACCOUNT (MAINS)

YEAR OF ADVT: 2020 DATE OF EXAM: 27-OCT-2023

Pages 4

Sl.no.

294

GENERAL KNOWLEDGE

MARKS : 100

TIME : 3 HOURS

**Each question carries 2 (two) marks :**

1. What is the difference between 'Hinayana' and 'Mahayana' Buddhism ?
2. Who founded the Din-i-Ilahi or the Divine Faith ? What was his objective?
3. What was the Doctrine of Lapse ?
4. Name the gods forming the trimurti traditionally worshipped in India.
5. Why did Subhash Chandra Bose resign as the President of the Congress?
6. What is Delegated Legislation ?
7. What is Consolidated Fund of India ?
8. What is meant by Judicial Review ?
9. If the office of the governor of a state falls vacant suddenly, who succeeds him ?
10. Can the Rajya Sabha amend the proposals contained in the Budget ? Give reasons for your answer.
11. What is 'Fiscal Deficit' ?
12. What is meant by Devaluation of a currency ?
13. What is Sustainable Development ?

14. Explain the term 'Disguised unemployment'.
15. What is Pradhan Mantri Ujjwala Yojana (PMUY)?
16. Why noon is hotter than the morning and the evening?
17. What are Asteroids?
18. What is Indian Standard Time as per Greenwich Mean Time (GMT)?
19. What are Antipodes?
20. What is meant by 'Denudation'?
21. What are Seismic lines?
22. What is Thermal Inversion?
23. What are the two major sinks for carbon dioxide?
24. Why west flowing rivers of Peninsular India have no deltas?
25. What is 38<sup>th</sup> parallel line?
26. On what principle the artificial kidney operates?
27. What is the main excretory product of a frog?
28. What is Haemopoiesis?
29. What is Hypothalamus?
30. What is meant by Acupuncture?

31. What is meant by Test Tube Baby ?
32. Why does water get cooled in earthen pitchers ?
33. Explain why the same side of the moon always faces the earth ?
34. What is Digital Twin ?
35. What is meant by Artificial Photosynthesis ?
36. What is meant by the term De-extinction ?
37. What are Oncolytic viruses ?
38. What is meant by 'booting' in operating system ?
39. Differentiate between Nuclear Fusion and Nuclear Fission.
40. What are Cardiovascular Diseases ?
41. What is meant by Passive Immunisation ?
42. Why is one's breath visible in cold, but not in hot weather ?
43. Why a small space is left between each set of two rails of a railway line ?
44. What is Mach 1 speed for an aeroplane ?
45. How does a refrigerator keep food fresh ?
46. Why is there an extra day in the leap year ?
47. Distinguish between a dynamo and an electric motor.

48. Distinguish between reflection and refraction of light.

49. Why is the flash of lightning seen before the sound of thunder.

50. Who started the Home Rule Movement in India ? What was the objective of this Movement ?

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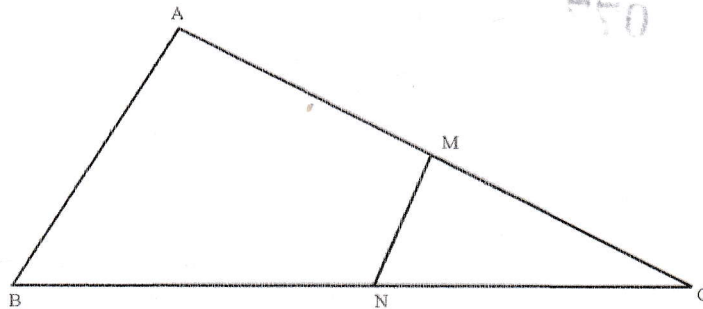
ARITHMETIC

MARKS : 100

TIME : 3 HOURS

**Answer Any FIVE Questions.**

1. a) A car covers a distance of 400 km at a certain speed. Had the speed been 12 km/h more, the time taken for the journey would have been 1 hour 40 minutes less. Find the original speed of the car. 7
- b) There are six consecutive odd numbers. The difference between the square of the average of last three numbers and the first three numbers is 288. What is the last odd number? 7
- c) Find the least number of complete years in which a sum of money put out at 40% annual compound interest will be more than tripled? 6
2. a) 16 men and 10 women together can complete a project in 10 days. If 12 women can complete the project in 25 days, in how many days 10 men can complete the same project? 7
- b) If the sum of first  $p$  terms of an A. P is equal to the sum of first  $q$  terms, then find the sum of the first  $(p + q)$  terms. 7
- c) The HCF and LCM of two polynomials are  $(x+3)$  and  $(x^3-9x^2-x+105)$  respectively. If one of the two polynomials is  $x^2-4x-21$ , then find the other polynomials. 6
3. a) In the figure,  $MN \parallel AB$ ,  $BC = 7.5\text{cm}$ ,  $AM = 4\text{cm}$  and  $MC = 2\text{cm}$ . Find the length of  $BN$ . 7



b) Pipe A can fill a tank in 4 hours and pipe B can fill it in 6 hours. If they are opened on alternate hours and if pipe A is opened first, find in how many hours the tank will be full ? 7

c) If the vertices of a triangle are  $(1, -3)$ ,  $(4, p)$  and  $(-9, 7)$  and its area is 15 square units, find the value of  $p$ . 6

4. a) A man sells an article at 5% above its cost price. If he had bought it at 5% less than what he had paid for it and sold it at Rs. 2 less, he would have gained 10%. Find the cost price of the article. 7

b) Show that there exists no rational number whose square is 5. 7

c) Let PQRS be a parallelogram whose diagonals PR and QS intersect at O. If triangle QRS is an equilateral triangle having a side of length 10cm, find the length of the diagonal PR. 6

5. a) Show that :

$${}^2_3 \operatorname{cosec}^2 58^\circ - {}^2_3 \cot 58^\circ \tan 32^\circ - {}^5_3 \tan 13^\circ \tan 37^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ = -1.$$

7

b) Two tangent segments PA and PB are drawn to a circle with centre O such that  $\angle APB = 120^\circ$ , prove that  $OP = 2AP$ . 7



c) If  $x = \frac{\sqrt{13} + \sqrt{11}}{\sqrt{13} - \sqrt{11}}$  and  $y = \frac{1}{x}$ . Find the value of  $3x^2 - 5xy + 3y^2$ . 6

6. a) If the mode of the following distribution is 57.5, find the value of x. 7

class interval	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	6	10	16	x	10	5	2

b) A rectangular red carpet of size 6 ft by 12 ft has a dark red border 6 inches wide. Find the area of the dark red border. 7

c) A bag contains 3 red balls, 5 black balls and 4 white balls. A ball is drawn at random from the bag, what is the probability that the ball drawn is - 6  
 i. white?      ii. red?      iii. black?      iv. not red?

7. a) The rain water from a roof of 22m by 20m drains into a cylindrical vessel having diameter of base 2m and height 3.5m. If the vessel is just full, find the rain fall in cm. 7

b) Prove that  $\frac{\cos^2 \theta}{1 - \tan \theta} + \frac{\sin^3 \theta}{\sin \theta - \cos \theta} = 1 + \sin \theta \cos \theta$  7

c) The sum of the present ages of father and son is 68 years. 8 years ago, the ratio of their ages was 12:1. Find the ratio of their ages after 4 years. 6

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**ESSAY & PRECIS WRITING****MARKS : 100****TIME : 2.5 HOURS****SECTION-I****1. Write a Precis of the following passage and give a suitable title :**

35+5=40

It is, perhaps, no accident that many of the outstanding figures of the past were exceptionally versatile men. Right up until comparatively recent times, it was possible for an intelligent person to acquaint himself with almost every branch of knowledge. Thus, men of genius like Leonardo da Vinci or Sir Philip Sidney were engaged in many careers at once as a matter of course. Da Vinci was so busy with his numerous inventions that he barely found the time to complete his paintings; Sidney, who died in battle when he was only thirty two years old, was not only a great soldier but a brilliant writer and poet as well. Both these men came very near to fulfilling the Renaissance ideal of the 'universal man,' the man who was proficient at everything.

Today, we rarely, if ever, hear that a musician has just invented a new type of submarine. Knowledge has become divided and sub-divided into countless, narrowly-defined compartments. The specialist is venerated; the versatile person, far from being admired, is more often regarded with suspicion. The modern world is a world of highly skilled experts' who have had to devote the greater part of their lives to a very limited field of study in order to compete with their fellows.

With this high degree of specialization, the frontiers of knowledge are steadily being pushed back more rapidly than ever before. But this has not been achieved without considerable cost. The scientist, who outside his own particular subject is little more than a moron, is a modern phenomenon; as is the man of letters who is barely aware of the tremendous strides that have been made in technology. Similarly specialization has indirectly affected quite ordinary people in every walk of life. Many activities which were once pur-



sued for their own sakes, are often given up in despair; they require techniques, the experts tell us, which take a lifetime to master. Why learn to play the piano when you can listen to the world's greatest pianists in your own drawing room?

Little by little, we are becoming more and more isolated from each other. It is almost impossible to talk to your neighbour about his job, even if he is engaged in roughly the same work as you are. The Royal Society in Britain includes among its members only the most eminent scientists in the country. Yet it is highly disconcerting to find that even here, as one of its Fellows put it, at a lecture only ten percent of the members can understand fifty percent of what is being said. (430 words)

## SECTION-II

**2. Write an essay on ANY ONE of the following topics :**

60

- a) Problems of Working Women in our Country
- b) The Impact of television on our Cultural Values
- c) Freedom of the Press in India today
- d) Tradition and Progress

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