

SSC GRADUATE LEVEL TIER-I EXAM (MORNING SHIFT) , 19-05-2013 – PREVIOUS YEAR PAPER

GENERAL AWARENESS

1. Division of Powers and Independent Judiciary are the two important features of
- (1) Socialist form of Government
 - (2) Unitary form of Government
 - (3) Democratic form of Government
 - (4) Federal form of Government

Solution:3

2. Which Article of the Indian Constitution did Dr. B.R. Ambedkar term as the “Heart and Soul of the Indian Constitution”?
- (1) Article 14
 - (2) Article 19
 - (3) Article, 356
 - (4) Article 32

Solution:4

3. Who was the first to use the term ‘State’?
- (1) Hobbes
 - (2) Plato
 - (3) Aristotle
 - (4) Machiavelli

Solution:4

4. Under which Article of the Constitution of India, can the fundamental rights of the members of the Armed Forces be specifically restricted?
- (1) Article 33
 - (2) Article 19
 - (3) Article 21
 - (4) Article 25

Solution:1

5. Pulakesin II was the greatest ruler of the
- (1) Cholas of Tamil Nadu

- (2) Chalukyas of Badami
- (3) Chalukyas of Kalyani
- (4) Pallavas of Kanchi

Solution:2

6. The Uttaramerur inscription provides information on the administration of the

- (1) Chalukyas
- (2) Satavahanas
- (3) Pallavas
- (4) Cholas

Solution:4

7. Pitts India Act of 1784 was a/ an

- (1) White paper
- (2) Regulating Act
- (3) Ordinance
- (4) Resolution

Solution:2

8. Which one of the following statements is not true in respect of A.O. Hume ?

- (1) He was an ornithologist.
- (2) He was a member of the Indian Civil Service.
- (3) He founded the Indian National Congress,
- (4) He presided over the Congress Annual Sessions twice.

Solution:4

9. Social accounting system in India is classified into

- (1) Income, product and expenditure
- (2) Enterprise, households and government
- (3) Assets, liabilities and debt position
- (4) Public sector, Private sector and Joint sector

Solution:1

10. Forced Savings refer to

- (1) Reduction of consumption consequent to a rise in prices
- (2) Taxes on individual income and wealth
- (3) Compulsory deposits imposed on income tax payers
- (4) Provident fund contribution of private sector employees

Solution:1

11. The demand for labour is called

- (1) Market demand
- (2) Direct demand
- (3) Derived demand
- (4) Factory demand

Solution:3

12. Which of the following is not an investment expenditure in goods and services?

- (1) Expansion of the main plant of a company
- (2) Purchase of a house
- (3) Purchase of machinery
- (4) An increase in business inventories

Solution:2

13. Which one of the following represents the Savings of the Private Corporate Sector?

- (1) Dividends paid to shareholders
- (2) Total profits of a company
- (3) Undistributed profits
- (4) Excess of income over expenditure

Solution:3

14. Who presides over the Joint Session of Indian Parliament?

- (1) Speaker of Lok Sabha
- (2) President of India
- (3) Chairperson of Rajya Sabha
- (4) Seniormost Member of Parliament

Solution:1

15. Teeth and Bones acquire strength and rigidity from

- (1) Calcium
- (2) Fluorine
- (3) Chlorine
- (4) Sodium

Solution:1

16. The type of tail found in Shark is

- (1) Protocercal
- (2) Homocercal
- (3) Heterocercal
- (4) Diphyccercal

Solution:3

17. The Sigmoid Colon is part of

- (1) Small Intestine
- (2) Anal Canal
- (3) Large Intestine
- (4) Ileum

Solution:3

18. A good conductor while carrying current is

- (1) alternately charged positive and negative
- (2) negatively charged
- (3) positively charged
- (4) electrically neutral

Solution:2

19. The angle between the magnetic meridian and the geographical meridian at a place is

- (1) Azimuth
- (2) Dip
- (3) Declination
- (4) Latitude

Solution:3

20. The device used for measuring the wavelength of X-rays is

- (1) G.M. Counter
- (2) Cyclotron
- (3) Bragg Spectrometer
- (4) Mass Spectrometer

Solution:3

21. Alpha particle is the nucleus of an atom of

- (1) Lithium
- (2) Hydrogen
- (3) Helium
- (4) Oxygen

Solution:3

22. Who is the founder of "Face-book" which is currently the No.1 social networking website in India?

- (1) Bill Gates
- (2) Martin Cooper
- (3) Orkut Buyukkokten
- (4) Mark Zuckerberg

Solution:4

23. In programming, repeating some statements is usually called

- (1) Compiling
- (2) Structure
- (3) Looping
- (4) Control structure

Solution:3

24. Which of the following move-ments saw the biggest peasant guerilla war on the eve of independence?

- (1) Noakhali Movement
- (2) Tebhaga Movement
- (3) Punnapra Vayalar Movement
- (4) Telangana Movement

Solution:4

25. Maps on large scale, representing both natural and man-made features are called

- (1) Wall maps
- (2) Topographic maps
- (3) Thematic maps
- (4) Atlas maps

Solution:2

26. Which river in India flows in a rift-valley?

- (1) Cauvery
- (2) Tapti
- (3) Narmada
- (4) Krishna

Solution:3

27. A narrow strip of land that connects two larger land masses is called

- (1) Strait
- (2) Peninsula
- (3) Cape
- (4) Isthmus

Solution:4

28. Tiny marine animals which constitute limestone skeletons are called

- (1) Clamitomonous
- (2) Foraminifera
- (3) Coral reefs
- (4) Diatoms

Solution:3

29. Apatanis are the major tribal group of

- (1) Jharkhand
- (2) Nagaland
- (3) Sikkim
- (4) Arunachal Pradesh

Solution:4

30. Which of the following plant pigments absorbs in red and far-red region of light?

- (1) Carotenoide
- (2) Chlorophyll
- (3) Phytochrome
- (4) Cryptochrome

Solution:3

31. The process through which excess of light energy is dissipated in photosynthesis is known as

- (1) Quenching
- (2) Scavenging
- (3) Photolysis
- (4) Photophosphorylation

Solution:1

32. AIDS virus destroys

- (1) Lymphocytes
- (2) Monocytes
- (3) Neutrophils
- (4) Basophils

Solution:1

33. Who among the following Presidents of MCC was a non-professional cricketer ?

- (1) Ted Dexter

- (2) Colin Cowdrey
- (3) Peter May
- (4) Christopher Martin Jenkins

Solution:4

34. Who won the Nobel Prize for Peace in 2012 ?

- (1) European Union
- (2) U.N. Intergovernmental Panel on Climate Change
- (3) International Atomic Energy Agency
- (4) Liu Xiaobo

Solution:1

35. Who won the Jnanpith Award for 2011?

- (1) Gopinath Mohanty
- (2) Sitakant Mahapatra
- (3) Sachidananda Routray
- (4) Pratibha Ray

Solution:4

36. Who is the author of the book "No Full Stops in India"?

- (1) R.K. Narayan
- (2) Ved Mehta
- (3) Nirad C. Choudhuri
- (4) Mark Tully

Solution:4

37. Which one of the following pairs is **wrongly** matched?

- | Place | – | Location |
|----------------------|---|-----------|
| (1) Trafalgar Square | – | London |
| (2) Red Square | – | Moscow |
| (3) Tiananmen Square | – | Beijing |
| (4) Tahrir Square | – | Abu Dhabi |

Solution:4

38. The term of a non-permanent member of the U.N. Security Council is

- (1) 3 years
- (2) 6 months
- (3) 1 year
- (4) 2 years

Solution:4

39. Who is the Chairman of the 20th Law Commission?

- (1) Justice Usha Mehra
- (2) Justice J.S. Verma
- (3) Justice K.G. Balakrishnan
- (4) Justice D.K. Jain

Solution:4

40. Julia Gillard is the Prime Minister of

- (1) New Zealand
- (2) Belgium
- (3) Canada
- (4) Australia

Solution:4

41. Which is the first state in India to pass the Food Security Law?

- (1) Punjab
- (2) Kerala
- (3) Chhattisgarh
- (4) Gujarat

Solution:3

42. Silicone is a polymer of

- (1) Tetraalkyl silane
- (2) Silicon tetrachloride
- (3) Dialkyl dichloro silane
- (4) Silane

Solution:3

43. Which is a natural colloid ?

- (1) Sodium chloride
- (2) Urea
- (3) Cane-sugar
- (4) Blood

Solution:4

44. Which one of the following does not contain Silver ?

- (1) Ruby Silver
- (2) Lunar Caustic
- (3) German Silver
- (4) Horn Silver

Solution:3

45. The presence of Cobalt in Vitamin B12 was established for the first time by
- (1) Hydrolysis test
 - (2) Spectroscopy
 - (3) Borax-Bead test
 - (4) Sodium Nitroprusside test

Solution:2

46. Which bacterial strain developed from natural isolates by genetic manipulations can be used for treating oil spills ?
- (1) Pseudomonas
 - (2) Agrobacterium
 - (3) Clostridium
 - (4) Nitrosomonas

Solution:4

47. Coating of solid waste with impervious material is known as
- (1) Encapsulation
 - (2) Chemical fixation
 - (3) Landfill
 - (4) Capping

Solution:1

48. Ultraviolet rays can be used in water treatment as
- (1) Flocculator
 - (2) Precipitator
 - (3) Hydrolyser
 - (4) Disinfectant

Solution:4

49. 'Thiamidine dimer formation in DNA is caused by
- (1) IR-rays
 - (2) X-rays
 - (3) β and γ -rays
 - (4) UV-rays

Solution:4

50. Winner of the Australian Open Men's Singles Title in 2013 is
- (1) David Ferrer

- (2) Andy Murray
- (3) Roger Federer
- (4) Novak Djokovic

Solution:4



ENGLISH COMPREHENSION

Directions (1-5) : In the following questions, some parts of the sentences have errors and some are correct. Find out which part of a sentence has an error. The number of that part is the answer. If a sentence is free from error, your answer is (4), i.e., No error.

1. If I was he,(1)/ I wouldn't accept (2)/ this project. (3) / No error.(4)

Solution:1

2. The teacher advised to (1)/the student to borrow (2) / a book from the library within three days.(3) /No error. (4)

Solution:1

3. I insisted (1)/ on his going (2)/ there immediately. (3)/ No error.(4)

Solution:4

4. We have been knowing (1)/ each other (2)/ since we were children. (3)/ No error. (4)

Solution:1

5. Neither of the teams (1)/ are sensible enough (2)/ to do this task. (3)/ No error. (4)

Solution:2

Directions (6-10) : In the following questions, sentences are given with blanks to be filled with an appropriate word(s). Four alternatives are suggested for each question. Choose the correct alternative out of the four.

6. All is not wellthe automobile sector.

- (1) down
(2) in
(3) to
(4) of

Solution:4

7. Many premier educational institutions come forward to have a..... with flourishing industries.

- (1) tie-up
(2) tie-in

- (3) tie-on
- (4) tie-down

Solution:1

8. He slippedhis old ways and started drinking again.

- (1) off
- (2) by
- (3) in
- (4) into

Solution:4

9. They reached the railway station before the train.....

- (1) had been left
- (2) left
- (3) was leaving
- (4) had left

Solution:2

10. The Information and Communication Technology hasage and employs very highly paid technocrats.

- (1) come upon
- (2) come out of
- (3) come through
- (4) come of

Solution:4

Directions (11-13) : In the following questions out of the four alternatives, choose the one which best expresses the meaning of the given word.

11. Citadel

- (1) mansion
- (2) fortress
- (3) palace
- (4) metropolis

Solution:2

12. Stern

- (1) young
- (2) stem
- (3) strict
- (4) lenient

Solution:3

13. Aberration
 (1) intensification
 (2) deviation
 (3) rationality
 (4) justification

Solution:2

Directions (14-16) : In the following questions, choose the word opposite in meaning to the given word.

14. Dwindle
 (1) diminish
 (2) shrink
 (3) increase
 (4) decrease

Solution:3

15. Dormant
 (1) inactive
 (2) dorsal
 (3) domestic
 (4) active

Solution:4

16. Tranquility
 (1) quiet
 (2) serenity
 (3) peace
 (4) disturbance

Solution:4

Directions (17-21) : In the following questions, four alternatives are given for the Idiom/Phrase printed in bold in the sentence_ Choose the alternative which bes: expresses the meaning of the Idiom /Phrase.

17. **Let sleeping dogs lie.**
 (1) Dogs can raise tempers
 (2) Do not allow dogs to star-:
 (3) Prevent dog mobility
 (4) Do not bring up an old controversial issue

Solution:4

18. To get admission in present day educational institutions all children should **be born with a silver spoon in the mouth.**

- (1) always hold a silver spoon
- (2) be born with silver spoon
- (3) be born in a rich family
- (4) be born to silver spoon manufacturer

Solution:3

19. **'A man of straw'** means,

- (1) An unreasonable person
- (2) A man of no substance
- (3) A very active person
- (4) A worthy fellow

Solution:2

20. Children complain about their parents' gifts. They should learn **not to look a gift horse in the month.**

- (1) not to find fault with the gifts received
- (2) not to ask for more gifts
- (3) not to find goodness in the gifts
- (4) not to look at a horse's mouth

Solution:1

21. Acquiring a job is **a cakewalk** for a student who has good academic performance coupled with good attitude.

- (1) a difficult achievement
- (2) a walkway made with cakes
- (3) an easy achievement
- (4) walk away with a cake

Solution:3

Directions (22-31) : In the following questions, a sentence/ part of the sentence is printed in **bold**. Below are given alternatives to the **bold** sentence /part of the sentence at (1), (2) and (3) which may improve the sentence. Choose the correct alternative. In case no improvement is needed, your answer is (4).

22. **I wish I knew what is wrong with my car.**

- (1) I wish I knew what was wrong with my car.
- (2) I wish I had known what is wrong with my car.

(3) I wish I know what is wrong with my car.

(4) No improvement

Solution:1

23. **Just before he died, Amar, who is a poet, wrote this poem.**

(1) Amar wrote this poem who is a poet, just before he died.

(2) Just before he died, Amar, who was a poet, wrote this poem.

(3) Amar, who is a poet, wrote this poem just before he died.

(4) No improvement

Solution:3

24. **The flag will be risen on the 15th of August.**

(1) The flag will be raised on the 15th of August.

(2) The flag will be roused on the 15th of August.

(3) The flag will be rising on the 15th of August.

(4) No improvement

Solution:1

25. **If I had the money I would have bought the house.**

(1) If I have had the money I would have bought the house.

(2) If I had had the money I would have bought the house,

(3) If I have the money I would have bought the house.

(4) No improvement

Solution:2

26. Don't sit **in** the grass. It's wet.

(1) beside

(2) by the side of

(3) on

(4) No improvement

Solution:3

27. **The game is more important than the winning of the prize.**

(1) Gaming is more important than winning of the prize.

(2) The gaming is more important than the winning of the prize.

(3) The game is more important than winning of the prize.

(4) No improvement

Solution:4

28. The actor is out of jail, and **not exactly a free man**, since he will be under house

arrest for an additional 90 days.

- (1) if not exactly a free man
- (2) but not exactly a free man
- (3) though exactly a free man
- (4) No improvement

Solution:2

29. **Some players on the team suffer** from chronic knee problems and will not play in the next playoff.

- (1) Some players on the team suffers
- (2) Some player on the team suffered
- (3) Some player on the team suffer
- (4) No improvement

Solution:4

30. Sushma has wisdom, charm and **she has a good sense of humour.**

- (1) has a good sense of humour
- (2) Sushma had a good sense of humour
- (3) a good sense of humour
- (4) No improvement

Solution:1

31. They **knocked down** ten houses when they built the new road.

- (1) pulled down
- (2) ruptured
- (3) removed
- (4) No improvement

Solution:1

Directions (32-38) : In the following questions, out of the four alternatives, choose the one which can be substituted for the given words/sentence.

32. A study of sounds is known as

- (1) Stylistics
- (2) Linguistics
- (3) phonetics
- (4) Semantics

Solution:3

33. To reduce to nothing

- (1) Lull

- (2) Null
- (3) Annul
- (4) Cull

Solution:2

34. An obviously true or hackneyed statement

- (1) Syllogism
- (2) Iconic
- (3) Imagism
- (4) Truism

Solution:4

35. Words inscribed on a tomb

- (1) Epitaph
- (2) Epitome
- (3) Epistle
- (4) Epilogue

Solution:1

36. The act of producing beautiful handwriting using a brush or a special pen.

- (1) Calligraphy
- (2) Stencilling
- (3) Graphics
- (4) Hieroglyphics

Solution:1

37. A word composed of the first letters of the words in a phrase

- (1) Abridgement
- (2) Almanac
- (3) Anachronism
- (4) Acronym

Solution:4

38. A person of obscure position who has gained wealth

- (1) Promiscuous
- (2) Parvenu
- (3) Sumptuary
- (4) Extravagant

Solution:2

Directions (39-40) : In the following questions, four words are given in each

question, out of which only one word is correctly spelt. Find the correctly spelt word.

39. (1) bussyness
(2) business
(3) bussiness
(4) busyness

Solution:2

40. (1) questionnair
(2) questionnaire
(3) questionnare
(4) questionnaire

Solution:4

Directions (41-50) : In the following questions, you have a passage with 10 questions. Read the passage carefully and choose the best answer to each question out of the four alternatives.

PASSAGE

The postmaster first took up his duties in the village of Ulapur. Though the village was a small one, there was an indigo factory nearby and the proprietor, an Englishman, had managed to get a post office established.

Our postmaster belonged to Calcutta. He felt like a fish out of water in this remote village. His office and livingroom were in a dark thatched shed, not far from a green, slimy pond, surrounded on all sides by a dense growth.

The men employed in the inch-go factory had no leisure, moreover they were hardly desirable companions for decent folk. Nor is a Calcutta boy an adept in the art of associating with others. Among strangers he appears either proud or ill at ease. At any rate the postmaster had but little company, nor had he much to do. At times he tried his hand at writing a verse or two. That the movement of the leaves and clouds of the sky were enough to fill life with joy – such were the sentiments to which he sought to give expression. But God knows that the poor fellow would have felt it as the gift of a new life, if some genie of the Arabian Nights had in one night swept away the trees, leaves and all, and replaced them with a macadamised road, hiding the clouds from view with rows of tall houses.

41. The adjective used to describe the postmaster's living-room is
(1) dark
(2) light
(3) deep
(4) bright

Solution:1

42. What does the phrase 'ill at ease' in the passage mean ?

- (1) Disease
- (2) Comfortable
- (3) Uneasy
- (4) Forward

Solution:3

43. What does the phrase 'little company' in the passage mean ?

- (1) Hardly any friends
- (2) Small business
- (3) Business-like
- (4) Bad friendship

Solution:1

44. At times the postmaster wrote

- (1) novels
- (2) short stories
- (3) dramas
- (4) poems

Solution:2

45. The postmaster wrote on the

- (1) beauty of himself
- (2) beauty of the weather
- (3) beauty of the village
- (4) beauty of nature

Solution:4

46. The word 'genie', means

- (1) spirit
- (2) ghost
- (3) soul
- (4) monster

Solution:1

47. Which factory was situated near the village Ulapur ?

- (1) Rubber
- (2) Clothes
- (3) Dyes
- (4) Chemical

Solution:3

48. What does the idiom 'fish out of water' suggest?

- (1) Can die any moment
- (2) Grasping for breath
- (3) Amphibious creature
- (4) In unfamiliar surroundings

Solution:4

49. Find a word in the passage which is the opposite of "near",

- (1) Unknown
- (2) Close
- (3) Remote
- (4) Convenient

Solution:3

50. Find a word in the passage which means 'the owner of a business'.

- (1) Entrepreneur
- (2) Businessman
- (3) Proprietor
- (4) Constructor

Solution:3

QUANTITATIVE APTITUDE

1. A dozen pairs of socks quoted at 180 are available at discount of 20%. How many pairs of socks can be bought for 48?
- (1) 3 pairs
 - (2) 4 pairs
 - (3) 2 pairs
 - (4) 5 pairs

Solution:2

(2) \therefore S.P. of a dozen pairs of socks

$$= \frac{180 \times 80}{100} = \text{Rs. } 144$$

\therefore S.P. of 1 pair of socks

$$= \frac{144}{12} = \text{Rs. } 12$$

\therefore No of pairs available for

$$\text{Rs. } 48 = \frac{48}{12} = 4$$

2. The marked price of a table is 12,000. If it was sold for 10,500 after allowing a certain discount, then the rate of discount is
- (1) 17.5%
 - (2) 10%
 - (3) 12.5%
 - (4) 15%

Solution:3

$$(3) \text{ Discount} = 12000 - 10500$$

$$= \text{Rs. } 1500$$

If the discount per cent be x ,
then

$$\frac{12000 \times x}{100} = 1500$$

$$\Rightarrow x = \frac{1500 \times 100}{12000} = 12.5\%$$

3. The marked price of a radio set is 480. The shopkeeper allows a discount of 10% and gains 8%. If no discount is allowed, his gain percent would be
- (1) 25%
 - (2) 18%
 - (3) 18.5%
 - (4) 20%

Solution:4

(4) If the C.P. of radio be Rs. x .
then

$$\frac{x \times 108}{100} = \frac{480 \times 90}{100} = 432$$

$$\Rightarrow x = \frac{432 \times 100}{108} = \text{Rs. } 400$$

If no discount is allowed,

$$\text{Gain} = 480 - 400 = \text{Rs. } 80$$

Gain per cent

$$= \frac{80}{400} \times 100 = 20\%$$

4. The prices of a school bag and a shoe are in the ratio 7 : 5. The price of a school bag is 200 more than the price of a shoe. Then the price of a shoe is
- (1) 200

- (2) 700
 (3) 500
 (4) 1,200

Solution:3

$$\begin{aligned} (3) \quad 7x - 5x &= 200 \\ \Rightarrow 2x &= 200 \Rightarrow x = 100 \\ \therefore \text{Price of a pair of shoes} \\ &= 5x = 1500 \end{aligned}$$

5. A sum of 300 is divided among P, Q and R in such a way that Q gets 30 more than P and R gets 60 more than g. The ratio of their share is

- (1) 5 : 3 : 2
 (2) 2 : 3 : 5
 (3) 3 : 2 : 5
 (4) 2 : 5 : 3

Solution:2

$$\begin{aligned} (2) \quad Q &= P + 30 \Rightarrow Q - P = 30 \text{ and} \\ R - Q &= 60 = 2 \times 30 \\ \therefore \text{Required ratio} &= 2 : 3 : 5 \\ \text{Look : } 3 - 2 &= 1, 5 - 3 = 2. \end{aligned}$$

6. The average of nine numbers is 50. The average of the first five numbers is 54 and that of the last three numbers is 52. Then the sixth number is

- (1) 30
 (2) 34
 (3) 24
 (4) 44

Solution:3

$$\begin{aligned} (3) \quad \text{The sixth number} \\ &= 9 \times 50 - 5 \times 54 - 3 \times 52 \\ &= 450 - 270 - 156 = 24 \end{aligned}$$

7. The average of the first nine integral multiples of 3 is
- (1) 21
 - (2) 12
 - (3) 15
 - (4) 18

Solution:3

(3) Required average

$$= \frac{3(1 + 2 + 3 + \dots + 9)}{9}$$

$$= \frac{9 \times 10}{2 \times 3} = 15$$

8. An article is sold for ₹ 300 at a profit of 20%. Had it been sold for ₹ 235, the loss percentage would have been
- (1) 16
 - (2) 3
 - (3) 5
 - (4) 6

Solution:4

(4) C.P. of the article

$$= \frac{100}{120} \times 300 = \text{Rs. } 250$$

On selling at Rs. 235,

Loss per cent

$$= \frac{15}{250} \times 100 = 6\%$$

9. A box has 100 blue balls, 50 red balls, 50 black balls. 25% of blue balls and 50% of red balls are taken away. Percentage of black balls at present is
- (1) 50%

- (2) 25%
 (3) $33\frac{1}{3}\%$
 (4) 40%

Solution:3

(3) After taking away respective balls,

Number of balls in the box

$$= 75 + 25 + 50 = 150$$

\therefore Percentage of black balls

$$= \frac{50}{150} \times 100$$

$$= \frac{100}{3} = 33\frac{1}{3}\%$$

10. A and B together can complete a piece of work in 12 days, B and C can do it in 20 days and C and A can do it in 15 days. A, B and C together can complete it in
- (1) 12 days
 (2) 6 days
 (3) 8 days
 (4) 10 days

Solution:4

(4) (A + B)'s 1 day's work

$$= \frac{1}{12}$$

(B + C)'s 1 day's work

$$= \frac{1}{20}$$

(C + A)'s 1 day's work

$$= \frac{1}{15}$$

On adding all three,

2 (A + B + C)'s 1 day's work

$$= \frac{1}{12} + \frac{1}{20} + \frac{1}{15}$$

$$= \frac{5+3+4}{60} = \frac{1}{5}$$

\therefore (A + B + C)'s 1 day' x work

$$= \frac{1}{10}$$

Hence, the work will be finished in 10 days.

11. A and B together can complete a work in 3 days. They start together. But, after 2 days, B left the work. If the work is completed after 2 more days, B alone could do the work in
- (1) 10 days
 - (2) 4 days
 - (3) 6 days
 - (4) 8 days

Solution:3

$$(3) (A + B)'s\ 2\ days' work = \frac{2}{3}$$

$$\text{Remaining work} = 1 - \frac{2}{3} = \frac{1}{3}$$

$$\text{Time taken by A in doing } \frac{1}{3}$$

work = 2 days

\therefore Time taken by A in completing the work = 6 days

$$\therefore B's\ 1\ day's\ work = \frac{1}{3} - \frac{1}{6}$$

$$= \frac{2-1}{6} = \frac{1}{6}$$

\therefore B alone will complete the work in 6 days.

12. A does 20% less work than B. If A can complete a piece of work in 7.5 hours, then B can do it in

- (1) 10 hours
- (2) 4 hours
- (3) 6 hours
- (4) 8 hours

Solution:3

(3) Efficiency of A and B = 4 : 5

Ratio of respective time

$$= 5 : 4$$

\therefore Time taken by B

$$= \frac{4}{5} \times \frac{15}{2} = 6\ \text{hours}$$

13. A rational number between $\frac{3}{4}$ and $\frac{3}{8}$ is

(1) $\frac{12}{7}$

(2) $\frac{7}{3}$

(3) $\frac{16}{9}$

(4) $\frac{9}{16}$

Solution:4

$$\therefore (4) \frac{3}{4} = \frac{3 \times 4}{4 \times 4} = \frac{12}{16}$$

$$\frac{3}{8} = \frac{6}{16}$$

$$\therefore \frac{6}{16}, \frac{7}{16}, \frac{8}{16}, \frac{9}{16}, \frac{10}{16}, \frac{11}{16}, \frac{12}{16}$$

\therefore Required rational number

$$= \frac{9}{16}$$

14. Product of two co-prime numbers is 117. Then their L.C.M. is

(1) 117

(2) 9

(3) 13

(4) 39

Solution:1

$$\therefore (1) \text{ HCF of two-prime numbers} \\ = 1$$

$$\therefore \text{ Product of numbers} = \text{their} \\ \text{LCM} = 117$$

15. The diameters of two circles are the side of a square and the diagonal of the square. The ratio of the areas of the smaller circle and the larger circle is
- (1) 1 : 2
 - (2) 1 : 4
 - (3) $\sqrt{2} : \sqrt{3}$
 - (4) 1 : $\sqrt{2}$

Solution:1

∴ (1) Side of square = x units

Diagonal of square = $\sqrt{2}x$ units

Radius of smaller circle = $\frac{x}{2}$
units

Radius of larger circle

$$= \frac{\sqrt{2}x}{2} = \frac{x}{\sqrt{2}} \text{ units}$$

∴ Required ratio of areas

$$= \pi \frac{x^2}{4} : \frac{\pi x^2}{2}$$

$$= 2 : 4 = 1 : 2$$

16. The total surface area of a sphere is 8 square unit. The volume of the sphere is

- (1) $\frac{8\sqrt{2}}{3}\pi$ cubic unit
- (2) $\frac{8}{3}\pi$ cubic unit
- (3) $8\sqrt{3}\pi$ cubic unit
- (4) $\frac{8\sqrt{3}}{5}\pi$ cubic unit

Solution:1

(1) Surface area of sphere

$$= 4\pi r^2$$

$$\Rightarrow r^2 = 2 \Rightarrow r = \sqrt{2} \text{ units}$$

\therefore Volume of sphere

$$= \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \times (\sqrt{2})^3$$

$$= \frac{8\sqrt{2}}{3}\pi \text{ cubic units}$$

17. A conical flask is full of water. The flask has base radius r and height h . This water is poured into a cylindrical flask of base radius m . The height of water in the cylindrical flask is

(1) $\frac{m}{2h}$

(2) $\frac{h}{2}m^2$

(3) $\frac{2h}{m}$

(4) $\frac{h}{3m^2}$

Solution:4

(4) Volume of water in conical flask

$$= \frac{1}{3} \pi r^2 h$$

If the height of water level in cylindrical flask be H units, then

$$\pi m^2 r^2 H = \frac{1}{3} \pi r^2 h$$

$$\Rightarrow H = \frac{1}{3} \cdot \frac{\pi r^2 h}{\pi m^2 r^2} = \frac{h}{3m^2}$$

18. An equation of the form $ax + by + c = 0$ where $a \neq 0, b \neq 0, c = 0$ represents a straight line which passes through

(1) (0, 0)

(2) (3, 2)

(3) (2, 4)

(4) None of these

Solution:

$$(1) ax + by + c = 0$$

When $c = 0$,

$$ax + by = 0$$

$$by = -ax \Rightarrow y = -\frac{a}{b}x$$

When $x = 0$, $y = 0$ i.e. this line passes through the origin (0, 0).

19. The numerator of a fraction is 4 less than its denominator. If the numerator is decreased by 2 and the denominator is increased by 1, then the denominator becomes eight times the numerator. Find the fraction.

(1) $\frac{3}{8}$

(2) $\frac{3}{7}$

(3) $\frac{4}{8}$

(4) $\frac{2}{7}$

Solution:2

(2) Original fraction = $\frac{x-4}{x}$

In case II,

$$8(x-4-2) = x+1$$

$$\Rightarrow 8x-48 = x+1$$

$$\Rightarrow 7x = 49 \Rightarrow x = 7$$

 \therefore Original fraction

$$= \frac{7-4}{7} = \frac{3}{7}$$

20. If $x^2=y+z$, $y^2=z+x$ and $z^2 = x+y$, then the value of

$$\frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{1+z}$$
 is

(1) -1

(2) 1

(3) 2

(4) 0

Solution:2

$$(2) x^2 = y + z$$

$$\Rightarrow x^2 + x = x + y + z$$

$$\Rightarrow x(x + 1) = x + y + z$$

$$\Rightarrow x + 1 = \frac{x + y + z}{x}$$

$$\Rightarrow \frac{1}{x+1} = \frac{x}{x+y+z}$$

$$\text{Similarly, } \frac{1}{y+1} = \frac{y}{x+y+z}$$

$$\frac{1}{z+1} = \frac{z}{x+y+z}$$

$$\therefore \frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{1+z}$$

$$= \frac{x}{x+y+z} + \frac{y}{x+y+z} + \frac{z}{x+y+z}$$

$$= \frac{x+y+z}{x+y+z} = 1$$

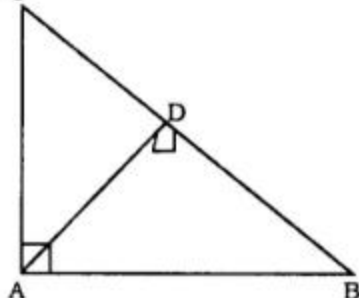
In a triangle ABC, $\angle A = 90^\circ$.

21. $\angle C = 55^\circ$, $\overline{AD} \perp \overline{BC}$. What is the value of $\angle BAD$?

- (1) 35°
- (2) 60°
- (3) 45°
- (4) 55°

Solution:4

. (4) C



$$\angle A = 90^\circ, \angle C = 55^\circ,$$

$$\therefore \angle B = 90^\circ - 55^\circ = 35^\circ$$

$$\angle ADB = 90^\circ$$

$$\therefore \angle BAD = 90^\circ - 35^\circ = 55^\circ$$

22. If G is the centroid of $\triangle ABC$ and $\triangle ABC = 48 \text{ cm}^2$, then the area of $\triangle BGC$ is

(1) 32 cm^2

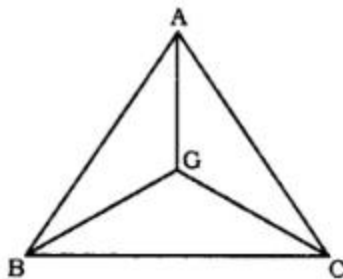
(2) 8 cm^2

(3) 16 cm^2

(4) 24 cm^2

Solution:3

(3)



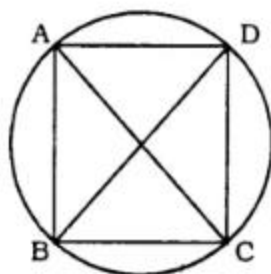
$$\triangle BGC = \frac{1}{3} \times \triangle ABC$$

$$= \frac{1}{3} \times 48 = 16 \text{ sq. cm.}$$

23. The diagonals AC and BD of a cyclic quadrilateral ABCD intersect each other at the point P. Then, it is always true that
- (1) $BP \cdot AB = CD \cdot CP$
 - (2) $AP \cdot CP = BP \cdot DP$
 - (3) $AP \cdot BP = CP \cdot DP$
 - (4) $AP \cdot CD = AB \cdot CP$

Solution:2

(2)



Here, AC and BD are chords of the circle.

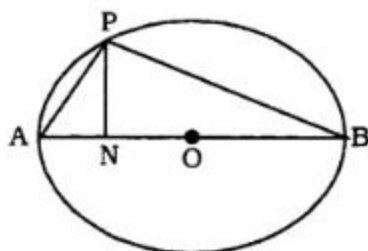
$$\therefore AP \cdot PC = BP \cdot PD.$$

24. N is the foot of the perpendicular from a point P of a circle with radius 7 cm, on a diameter AB of the circle. If the length of the chord PB is 12 cm, the distance of the point N from the point B is

- (1) $6\frac{5}{7}$ cm
- (2) $12\frac{2}{7}$ cm
- (3) $3\frac{5}{7}$ cm
- (4) $10\frac{2}{7}$ cm

Solution:4

(4)



$$AB = 14 \text{ cm, } PB = 12 \text{ cm}$$

$$\angle APB = 90^\circ$$

$$\therefore AP = \sqrt{14^2 - 12^2}$$

$$= \sqrt{(14 + 12)(14 - 12)}$$

$$= \sqrt{26 \times 2} = \sqrt{52}$$

$$ON = x \therefore AN = 7 - x; BN = 7 + x$$

$$\therefore \text{From } \triangle PAN, PN^2 = AP^2 - AN^2$$

$$= 52 - (7 - x)^2$$

$$\therefore \text{From } \triangle PNB,$$

$$PN^2 = (12)^2 - (7 + x)^2$$

$$\therefore 52 - (7 - x)^2 = 144 - (7 + x)^2$$

$$\Rightarrow 52 - (49 - 14x + x^2) = 144 -$$

$$(49 + 14x + x^2)$$

$$\Rightarrow 52 - 49 + 14x - x^2 = 144 - 49$$

$$- 14x - x^2$$

$$\Rightarrow 28x = 144 - 52 = 92$$

$$\Rightarrow x = \frac{92}{28} = \frac{23}{7}$$

$$\therefore BN = 7 + x$$

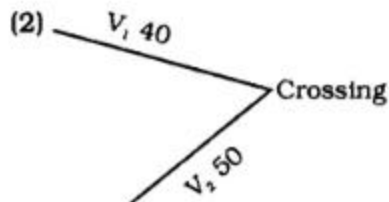
$$= 7 + \frac{23}{7} = \frac{49 + 23}{7} = \frac{72}{7}$$

$$= 10\frac{2}{7} \text{ cm}$$

25. Two cars are moving with speeds v_1, v_2 towards a crossing along two roads. If their distances from the crossing be 40 metres and 50 metres at an instant of time then they do not collide if their speeds are such that

- (1) $v_1 : v_2 = 16 : 25$
 (2) $v_1 : v_2 \neq 4 : 5$
 (3) $v_1 : v_2 \neq 5 : 4$
 (4) $v_1 : v_2 = 25 : 16$

Solution:2



If $\frac{40}{v_1} = \frac{50}{v_2}$ then they will collide i.e. cars will reach at the same time.

$$\therefore \frac{v_1}{v_2} \neq \frac{40}{50} = \frac{4}{5}$$

26. A certain distance is covered at a certain speed. If half of this distance is covered in double the time, the ratio of the two speeds is

- (1) 1 : 2
 (2) 4 : 1
 (3) 1 : 4
 (4) 2 : 1

Solution:2

(2) If the original speed be S_1 units and time = t_1 units and distance = D , then

$$\frac{D}{2t_1} = S_2$$

$$\therefore S_2 = \frac{D}{4t_1} \text{ and } S_1 = \frac{D}{t_1}$$

$$\therefore \frac{S_1}{S_2} = \frac{\frac{D}{t_1}}{\frac{D}{4t_1}} = \frac{4}{1}$$

27. The simple interest on 4,000 in 3 years at the rate of $x\%$ per annum equals the simple interest on 5,000 at the rate of 12% per annum in 2 years. The value of x is
- (1) 10%
 - (2) 6%
 - (3) 8%
 - (4) 9%

Solution:

(1) S.I.

$$= \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$$

$$\therefore \frac{4000 \times 3 \times x}{100}$$

$$= \frac{5000 \times 2 \times 12}{100}$$

$$\Rightarrow x = \frac{5 \times 2 \times 12}{4 \times 3}$$

$$= 10\% \text{ per annum}$$

28. If $x^2 - 3x + 1 = 0$, then the value of

$$x^2 + x + \frac{1}{x} + \frac{1}{x^2} \text{ is}$$

- (1) 10
- (2) 2
- (3) 6
- (4) 8

Solution:1

$$(1) \quad x^2 - 3x + 1 = 0$$

$$\Rightarrow x^2 + 1 = 3x$$

Dividing both sides by x ,

$$\Rightarrow x + \frac{1}{x} = 3$$

$$\therefore x^2 + x + \frac{1}{x} + \frac{1}{x^2}$$

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

$$= \left(x + \frac{1}{x} \right)^2 - 2 + \left(x + \frac{1}{x} \right)$$

$$= 9 - 2 + 3 = 10$$

If $\frac{4x-3}{x} + \frac{4y-3}{y} + \frac{4z-3}{z} = 0$,

29.

then the value of $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ is

- (1) 9
- (2) 3
- (3) 4
- (4) 6

Solution:3