

ENTRANCE EXAMINATIONS, JUNE 2017 QUESTION PAPER BOOKLET

Ph.D.(Cognitive Science)

Marks: 80

Time: 2.00 hrs.

Hall Ticket No. _____

1. Write your Hall Ticket Number in the OMR Answer Sheet given to you. Also write the Hall Ticket Number in the space provided above.
2. Read carefully the following instructions:
 - a. This Question paper has Two Sections: Part- I and Part- II .
 - b. Part - I has 40 and Part - II has 40 objective type questions of one mark each.
 - c. **There is negative marking for all the questions in parts I and II. Each wrong answer carries -0.33 mark.**
 - d. Answers are to be marked on the OMR answer sheet following the instructions provided there upon.
 - e. Calculators are permitted. Logarithmic tables are not allowed
 - f. Hand over the OMR answer sheet at the end of the examination to the Invigilator.
 - g. No additional sheets will be provided. Rough work can be done in the question paper itself / space provided at the end of the booklet.

PART I

1. When is the effect of an independent variable on a dependent variable considered to be statistically significant?
 - A. When $p = 0.05$
 - B. When $p > 0.05$
 - C. When $p < 0.05$
 - D. When $p < 0.5$

2. Twenty men and 20 women participated in a study examining height differences between men and women. During the analysis of the data from this experiment using repeated measures ANOVA, gender of the participants:
 - A. Would be considered as a within-subjects factor
 - B. Would be considered as a between-subjects factor
 - C. Would be considered as a dependent variable
 - D. Would be not included in the analysis

3. Which one of the following variables is not categorical?
 - A. Weight of a person.
 - B. Gender of a person
 - C. Choice on a test item
 - D. Marital status of a person

4. Which one of these statistics is unaffected by outliers?
 - A. Mean
 - B. Interquartile range
 - C. Standard deviation
 - D. Range

5. If Q_1, Q_2, Q_3 are first, second and third quartiles respectively, what is Interquartile range?
 - A. $Q_3 - Q_1$
 - B. $Q_3 + Q_1$
 - C. Q_2
 - D. $Q_1 + Q_2 + Q_3$

6. When is the performance on a 2AFC task considered to be at chance level?
 - A. When $d' = 0$
 - B. When $d' < 0$
 - C. When $d' = 1$
 - D. When $d' = 1$

7. In a semantic/category fluency task, how much time is generally given to participants to produce words in each category?
- A. 3 minutes
 - B. 1 minute
 - C. 30 seconds
 - D. 5 minutes
8. _____ bias occurs when participants or items are not chosen at random but instead are selected so that an attribute is over- or under-represented.
- A. Response
 - B. Reliability
 - C. Validity
 - D. Sampling
9. Pick the choice that best completes the following sentence. If a relationship between two variables is called statistically significant, it means the investigators think the variables are
- A. related in the population represented by the sample.
 - B. not related in the population represented by the sample.
 - C. related in the sample due to chance alone.
 - D. very important.
10. Which of the following findings is not a correlation?
- A. As testosterone increases so too does verbal aggression
 - B. As download prices increase sales will decrease
 - C. Women scored higher than men on narcissism
 - D. None of these

Questions 11-12 are based on the information contained in the following passage.

A boy is asked to put in a basket one papya when ordered "One", one banana when ordered "Two", one apple when ordered "Three" and is asked to take out one papya and one banana when ordered "Four". The following sequence of orders is given:

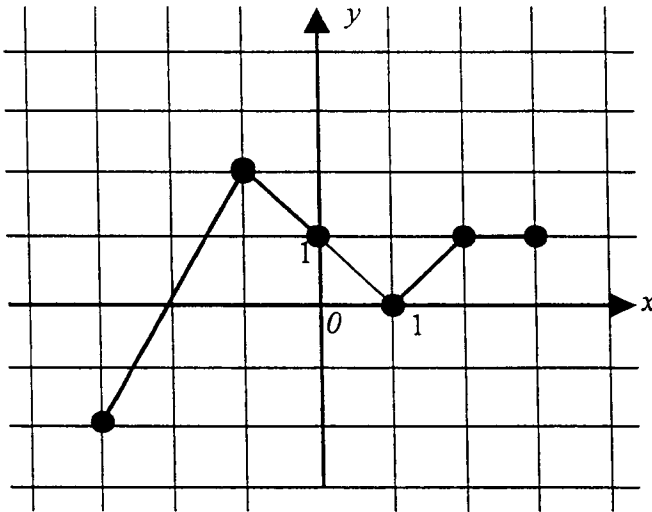
12332142314223314113234

11. How many total papayas were in the basket at the end of the above sequence?
- A. 1
 - B. 4
 - C. 3
 - D. 2

12. How many total fruits would be in the basket at the end of the above sequence?

- A. 9
- B. 8
- C. 11
- D. 10

13. The figure below shows the graph of the function f in the xy -plane. What is the value of $f(f(-1))$?



- A. -2
- B. -1
- C. 0
- D. 1

14. X and only X is thought to cause Y. You will test this by testing for Y

- A. By inactivating X in a system that exhibits Y always and inactivating X in system that does not exhibit Y.
- B. By increasing X and checking what happens to Y
- C. By increasing X followed decreasing X and checking what happens to Y
- D. By inactivating X in a system that has functional X and activating X in the system that does not have functional X and checking what happens to Y

15. When you increase the number of measurements in a sample

- A. Variance of the sample decrease
- B. Variance of the mean of the sample decrease
- C. Variance of the sample increase
- D. Mean of the sample decrease.

16. Two dice are thrown simultaneously. What is the probability of getting two numbers whose product is odd?
- A. $1/2$
 - B. $3/4$
 - C. $1/4$
 - D. $5/16$
17. The standard deviation of the data 8, 5, 9, 10 is
- A. $\sqrt{14/3}$
 - B. $14/3$
 - C. 0
 - D. $14/4$
18. In a multimodal distribution
- A. Mean and mode can be same
 - B. Mean and mode will be different
 - C. Mean and median will be same
 - D. Cannot say
19. Skewness of a distribution is defined with respect to its
- A. Mode
 - B. Mean
 - C. Median
 - D. Standard deviation
20. A red light flashes 3 times per minute and a green light flashes 5 times in two minutes at regular intervals. If both lights start flashing at the same time, how many times do they flash together in each hour?
- A. 30
 - B. 34
 - C. 20
 - D. 60
21. It is important to teach students to use computers effectively. Therefore, students should be taught computer programming in school.

Which of the following, if true, most weakens the above argument.

- A. Only people who use computers effectively are skilled at computer programming.
- B. Only people skilled at computer programming use computers effectively.
- C. Some people who use computers effectively cannot write computer programs.
- D. Most people who are able to program computers use computers effectively.

22. Excessive amounts of mercury in drinking water, associated with certain types of industrial pollution, have been shown to cause Hobson's disease. Island R, has an economy based entirely on subsistence-level agriculture; modern industry of any kind is unknown in that island. The inhabitants of Island R have an unusually high incidence of Hobson's disease.

Which of the following can be validly inferred from the above statements?

- I. Mercury in drinking water is actually perfectly safe.
 - II. Mercury in drinking water must have sources other than industrial pollution.
 - III. Hobson's disease must have causes other than mercury in drinking water.
- A. II only
 - B. III only
 - C. I or III, but not both
 - D. II or III, or both
23. If $\frac{d-3n}{7n-d} = 1$, which of the following statements describes d in terms of n ?
- A. d is 5 times n .
 - B. d is 4 more than n .
 - C. d is $\frac{3}{7}$ of n .
 - D. d is 4 less than n .
24. 10 is the mean of a set of 7 observations and three more observations are added and the mean becomes 8.5. What is the mean of the three new observations added?
- A. 3
 - B. 8.5
 - C. 5
 - D. 10
25. Introducing a woman, a man said, "Her husband is the only son of my father." How is that woman related to the man?
- A. Wife
 - B. Sister
 - C. Cousin
 - D. Sister-in-law

26. Cow : Calf ::

- A. Pup : Bitch
- B. Cock : Chick
- C. Lioness : Cub
- D. Woman : Son

27. Chapters : Book ::

- A. Cookbooks : Recipe
- B. Articles : Journal
- C. Editions : Newspaper
- D. Magazines : Subscription

28. Arrange the words given below in a meaningful sequence.

1.Presentation 2.Recommendation 3. Arrival 4.Discussion 5.Introduction

- A. 5, 3, 4, 1, 2
- B. 3, 5, 4, 2, 1
- C. 3, 5, 1, 4, 2
- D. 5, 3, 1, 2, 4

29. A is B's sister. C is B's mother. D is C's father. E is D's mother. Then, how is A related to D?

- A. Grandfather
- B. Grandmother
- C. Daughter
- D. Granddaughter

30. In a certain code language COMPUTER is written as RFUVQNPC. How will MEDICINE be written in that code language?

- A. MFEDJJOE
- B. EOJDEJFM
- C. MFEJDJOE
- D. EOJDJEFM

31. In a certain code language,

'134' means 'good and tasty';
'478' means 'see good pictures' and
'729' means 'pictures are faint'.

Which of the following digits stands for 'see'?

- A. 9
- B. 2
- C. 1
- D. 8

32. In a certain code language,

- (A) 'pit na som' means 'bring me water'
- (B) 'na jo tod' means 'water is life'
- (C) 'tub od pit' means 'give me toy'
- (D) 'jo lin kot' means 'life and death'

Which of the following represents 'is' in that language ?

- A. jo
- B. na
- C. tod
- D. lin

For Questions 33 and 34, use the following information:

The Aliens Space Station is a high-rise complex of apartments. It is under construction. It has come up to 36 metres. Every floor of Aliens is 5 metres in height. Lanco Towers is a high-rise complex of offices and shops. It is fully occupied. Lanco is 27 metres tall. Aliens and Lanco are 20 metres apart. Yadgiri has a shop 36 metres away from Lanco and the bases of both Aliens and Lanco and the eye-level of Yadgiri (when he is standing in his shop) are on a horizontal line with Aliens first, then Lanco and thereafter Yadgiri's shop.

33. How many complete floors of Aliens Space Station can Yadgiri see standing in his shop?

- A. 2
- B. 3
- C. 1
- D. None

34. If Aliens rises by 1 metre and Yadgiri's eye-level moves 18 metres away from his shop, what part of Aliens can he now see?

- A. 2 floors
- B. 3 floors
- C. 1 floor
- D. Only the top

35. One-half of a number is 17 more than one-third of that number. What is the number?
- A. 52
 - B. 84
 - C. 102
 - D. 204
36. In a race, the odd favour of cars P,Q,R,S are 1:3, 1:4, 1:5 and 1:6 respectively. Find the probability that one of them wins the race.
- A. $\frac{319}{420}$
 - B. $\frac{27}{111}$
 - C. $\frac{114}{121}$
 - D. $\frac{231}{420}$

Answer questions 37 to 39 based on the passage below

Three friends Ishan, Imran, and Ian respectively have Rs. 160, Rs. 120 and Rs. 80. They start playing a game in which the person who has the maximum money gives to both the persons an amount equal to half the difference between his amount and the respective person's amount. The game stops when the difference between the amount any two of them have is less than Rs. 5

37. What would be the amount with Ishan at the end of the game?
- A. Rs.117.5
 - B. Rs. 122.5
 - C. Rs. 120
 - D. Rs. 125
38. What would be the amount with Imran at the end of the game?
- A. Rs. 115
 - B. Rs. 117.5
 - C. Rs. 120
 - D. Rs. 122.5
39. What would be the amount with Ian at the end of the game?
- A. Rs. 115
 - B. Rs. 117.5
 - C. Rs. 120
 - D. Rs. 122.5

40. If x/y is greater than y/z , then y/x is
- A. greater than z/y
 - B. lesser than z/y
 - C. equal to z/y
 - D. indeterminate

PART II

Stream : Cognitive Science

41. The Load theory of selective attention was proposed by whom?
- A. Anne Triesman
 - B. Nilli Lavie
 - C. Donald Broadbent
 - D. Stanislas Dehaene
42. Enhanced visual processing abilities in hearing impaired individuals can be attributed to:
- A. sign language use
 - B. cross modal plasticity in the brain
 - C. Both of the above
 - D. None of the above
43. In which of the following cases does the slope of the Response time (RT) to the target remain constant as a function of the number of distractors present in the search array?
- A. Serial search task
 - B. Parallel search task
 - C. Working memory task
 - D. All of the above

44. The words "apple" and "ant" are:
- A. phonological cohorts of each other
 - B. semantic competitors of each other
 - C. cross-linguistic competitors of each other
 - D. phonological rhymes of each other
45. The most common version of the dualist position in the mind-body problem has its roots in which philosopher?
- A. John Searle
 - B. Rene Descartes
 - C. Martin Heidegger
 - D. David Hume
46. In functional magnetic resonance imaging, what does BOLD stand for?
- A. Blood oxygenated label description
 - B. b.Blood onset list description
 - C. Blood oxygenated level dependent
 - D. Blood onset level dependent
47. The electrical activity in the motor cortex just before the initiation of a voluntary movement is commonly called as:
- A. Movement potential
 - B. Onset potential
 - C. Initiation potential
 - D. Readiness potential
48. In object naming studies, "switch cost" is defined as
- A. Difference in naming latency between a stay and switch trial
 - B. Average latency on all switch trials
 - C. Either of the above
 - D. None of the above

49. According to the dual stream model of visual processing proposed by Goodale and Milner, which stream(s) is/are responsible for identification and recognition of an object?
- A. Ventral stream
 - B. Dorsal stream
 - C. Both of the above
 - D. None of the above
50. The performance in which of the following tasks is not a measure of conflict resolution abilities?
- A. Stroop
 - B. Anti-saccade
 - C. Visual search
 - D. Flanker
51. What is the average time taken to initiate a saccade in humans?
- A. About 0.02 s
 - B. About 0.2 s
 - C. Greater than 0.5 s
 - D. Greater than 1 s
52. What is IOR in attention?
- A. Inhibition of return
 - B. Invariance of response
 - C. Inhibition of response
 - D. Invariance of return
53. In a standard Posner cueing task, which of the following is most commonly observed at short cue-target SOAs?
- A. $RT_{\text{on valid trials}} = 2 * RT_{\text{on invalid trials}}$
 - B. $RT_{\text{on valid trials}} > RT_{\text{on invalid trials}}$
 - C. $RT_{\text{on valid trials}} = RT_{\text{on invalid trials}}$
 - D. None of the above
54. What is speed-accuracy tradeoff?
- A. As speed of response increases, accuracy in performance decreases
 - B. As speed of response increases, accuracy in performance increases
 - C. As speed of response increases, accuracy in performance remains unchanged
 - D. None of the above

55. Which of the following would be categorized as an incongruent trial(s) in a colour-word stroop task?
- A. The word "RED" written in red ink
 - B. The word "APPLE" written in blue ink
 - C. The word "RED" written in blue ink
 - D. Both a and b
56. Which of the following suffered from a memory disorder following a surgery and was then extensively studied to understand the link between brain function and working memory in humans?
- A. HS
 - B. HM
 - C. GM
 - D. HH
57. What is the name of the bundle of fibres that connect left and right hemispheres of the brain?
- A. Glial cells
 - B. Corpus callosum
 - C. Arbor vitae
 - D. Purkinje fibres
58. Magnetoencephalography (MEG) is a powerful technology for brain imaging because it has good resolution both to the timing of neural events and, to a lesser extent, the location of those events in the brain. Which other brain imaging technologies also offer good temporal and spatial resolution?
- A. fMRI = good temporal resolution, EEG = good spatial resolution
 - B. TMS = good spatial resolution, PET = good temporal resolution
 - C. EEG = good temporal resolution, fMRI = good spatial resolution
 - D. PET = good spatial resolution, CT = good temporal resolution
59. _____ is a rebound period in which a person cannot pay attention to a different stimulus after having just paid attention to another stimulus.
- A. Vigilance
 - B. Change blindness
 - C. Repetition blindness
 - D. Attentional blink

60. The first step in sensory perception is signal transduction. In visual perception, light from the outside world is transduced by _____, which contain rhodopsin. In auditory perception, pressure is transduced in the cochlea by _____.
- A. Rods/cones; hair cells
 - B. Ganglion cells; hair cells
 - C. Rods/cones; tympanic membrane
 - D. Ganglion cells; tympanic membrane
61. Imagine that you flinch after seeing lightning because in previous instances the lightning is followed by thunder, which scared you. In this scenario, lightning can be interpreted as being a(n):
- A. unconditioned stimulus
 - B. unconditioned response
 - C. conditioned stimulus
 - D. conditioned response
62. Some measures of brain function reveal what brain region is necessary (causal) for a mental ability, and other brain measures reveal what brain region is associated (correlated) with a mental ability. Which answer below contains only causal measures?
- A. lesions and functional magnetic resonance imaging (fMRI)
 - B. fMRI and transcranial magnetic stimulation (TMS)
 - C. lesions and TMS
 - D. fMRI and diffusion tensor imaging (DTI)
63. Which of the following terms means "a disruption of language caused by brain damage"?
- A. Aphasia
 - B. Dyslexia
 - C. Ataxia
 - D. Dysphonia
64. According to load theory of selective attention, what happens under a perceptual load?
- A. Target processing is enhanced
 - B. Target processing is decreased
 - C. Target processing is unaffected
 - D. None of the above

65. Which brain region has been implicated for conflict monitoring in stroop task?
- A. a .pre-SMA
 - B. b. ACC
 - C. c. Hypothalamus
 - D. d. Insular cortex
66. Which ERP effect is traditionally linked with expectation violation?
- A. N400
 - B. P300
 - C. LRP
 - D. Both a and b.
67. Perception of stimulus that is below the threshold of awareness is known as:
- A. Just noticeable difference
 - B. Differential threshold
 - C. Subliminal perception
 - D. Signal detection
68. When central arrows are used to orient a participant's attention to a target in a Posner cueing task, it is an example of which form of attentional orienting:
- A. Endogenous
 - B. Exogenous
 - C. Either of the above
 - D. None of the above
69. What does an fMRI produce?
- A. computational image of the magnetic field surrounding the brain
 - B. A detailed case study of cognitive impairment based on computational models
 - C. A 3D computer generated image of the brain reflecting blood and oxygen flow produced during cerebral activity
 - D. A 2D image produced through radio-frequent waves in the magnetic field

70. According to the seminal study by George Miller, what is the number of items an average human can hold in working memory?
- A. 7 ± 2
 - B. 9 ± 2
 - C. 5 ± 2
 - D. < 5
71. Who proposed the global workspace theory of consciousness?
- A. Baars
 - B. Dennett
 - C. Chalmers
 - D. Churchland
72. Blindsight is a disorder where:
- A. There is an inability to recognize emotional facial expression
 - B. There is ability to provide semantic information about an object without being able to name it
 - C. There is an inability to provide semantic information about an object or to name it
 - D. There is a somewhat preserved ability to respond appropriately to visual stimuli in the blind region of the visual field despite the patient having no sense of seeing them
73. Which of the following paradigms/tasks is used to examine the parallel activation of two languages in bilinguals?
- A. Visual search
 - B. Visual world
 - C. Inhibition of return
 - D. Stop signal
74. What are homographs?
- A. Non words that sound like real words
 - B. Words that have dual meanings but the same spelling
 - C. Non words
 - D. Words with the same sound but different spellings associated with different meanings

75. In the bilingualism literature, what does 'cognitive advantages of bilingualism' refer to?
- A. Bilinguals tend to perform better than monolinguals on certain tasks measuring inhibitory control etc.
 - B. Bilinguals tend to be more social than monolinguals
 - C. Bilinguals tend to be wealthier than monolinguals
 - D. Bilinguals like participating more in cognitive science experiments than monolinguals.
76. Which of the following is not a component of 'executive control'?
- A. conflict resolution
 - B. inhibitory control
 - C. set shifting
 - D. none of the above
77. Which area of the brain is largely responsible for speech production?
- A. Wernicke's area
 - B. Occipital lobe
 - C. Broca's area
 - D. Parietal lobe
78. A secondary task involving the repetition of a redundant and irrelevant word is known as:
- A. Irrelevant speech effect
 - B. Visual suppression
 - C. Articulatory suppression
 - D. Fractionation
79. What does CFS stand for in the study of unconscious processing?
- A. Continuous flash suppression
 - B. Continuous flashing of sequences
 - C. Continuous filtering of stimuli
 - D. Combined flash suppression
80. How many levels does the perceptual awareness scale (PAS) proposed by Ramsay & Overgaard to measure subjective awareness of unconscious stimuli have?
- A. 2
 - B. 3
 - C. 4
 - D. 7