Vinod Gupta School of Management

Indian Institute of Technology Kharagpur

May 2017

Ph. D Entrance Examination: Written Test Sample Questions

Time: 2 Hours   **Total Marks: 80**

Name:_____

Application No.:_____

Signature: _____

Instructions:

1. **There are three sections in this question paper:**

   a. **Quantitative Aptitude (17 questions, 17 marks)**

   b. **English and Verbal Ability (33 questions, 33 marks)**

   c. **Descriptive Section (2 questions, [15X2= 30 marks])**

2. **There is no negative marking**

3. **Use capital letter for your choice in objective type questions.**

4. **If you use any small letter for your choice in objective type questions, then answer will not be evaluated.**

5. **Section 1 and Section 2 answer sheets are in page 2.**

6. **Total number of pages: 19**

Section A:		Section B:	
Quantitative Aptitude		**English and Verbal Ability**	
Q 1		**Q 31**	
Q 2		**Q 32**	
Q 3		**Q 33**	
Q 4		**Q 34**	
Q 5		**Q 35**	
Q 6		**Q 36**	
Q 7		**Q 37**	
Q 8		**Q 38**	
Q 9		**Q 39**	
Q 10		**Q 40**	
Q 11		**Q 41**	
Q 12		**Q 42**	
Q 13		**Q 43**	
Q 14		**Q 44**	
Q 15		**Q 45**	
Q 16		**Q 46**	
Q 17		**Q 47**	
Q 18		**Q 48**	
Q 19		**Q 49**	
Q 20		**Q 50**	
Q 21			
Q 22			
Q 23			
Q 24			
Q 25			
Q 26			
Q 27			
Q 28			
Q 29			
Q 30			

Section 1: Quantitative Aptitude

(30 Marks, 30 Questions)

Q1. Rajesh Walks to and fro to a shopping mall. He spends 30 minutes shopping. If he walks at speed of 10 km an hour, he returns home at 19.00 hours. If he walks at 15 km an hour, he returns home at 18.30 hours. How fast must he walk in order to return home at 18.15 hours?

    A. 17 km/hour
    B. 17.5 km/hour
    C. 18 km/hour
    D. 19 km/hour
    E. None f these

Q2. In an examination, the average marks obtained by students who passed was x%, while the average of those who failed was y%. The average marks of all students taking the exam was z%. Find in terms of x, y and z, the percentage of students taking the exam who failed.

    A. (z-x)/ (y-x)
    B. (x-z)/(y-z)
    C. (y-x)/(z-y)
    D. (y-z)/(x-z)

Q3. Three circles A, B and C have a common centre O. A is the inner circle, B middle circle and C is outer circle. The radius of the outer circle C, OP cuts the inner circle at X and middle circle at Y such that OX = XY = YP. The ratio of the area of the region between the inner and middle circles to the area of the region between the middle and outer circle is:

A. 1/3
B. 2/5
C. 3/5
D. 1/5

Q4. If Sn denotes the sum of the first n terms in an Arithmetic Progression and S1 : S4 = 1 : 10 then the ratio of first term to fourth term is:

    A. 1:3
    B. 2:3
    C. 1:4
    D. 1:5

Q5. Set of real numbers 'x, y', satisfying, inequations $x - 3y \geq 0$, $x + y \geq -2$ and $3x - y \leq -2$ is:
A .Empty
B .Finite
C. Infinite
D. Cannot be determined

Q6. ABCD is a trapezium, such that AB, DC are parallel and BC is perpendicular to them. If ∠DAB = 45°, BC = 2 cm and CD = 3 cm then AB = ?

A 5 cm
B 4 cm
C 3 cm
D 2 cm

Q7. The sum of the numbers from 1 to 100, which are not divisible by 3 and 5.

A. 2946
B. 2732
C. 2632
D. 2317

Q8. 5^6 - 1 is divisible by
A. 13
B. 31
C. 5
D. None of these

Q9. The sides of a triangle are 5, 12 and 13 units respectively. A rectangle is constructed which is equal in area to the triangle and has a width of 10 units. Then the perimeter of the rectangle is
   A. 30
   B. 26
   C. 13
   D. None of these

Q10. Which one of the following cannot be the ratio of angles in a right-angled triangle?
   A. 1 : 2 : 3
   B. 1 : 1 : 3
   C. 1 : 3 : 6
   D. None of these

Q11. The average age of a class of 39 students is 15 years. If the age of the teacher be included, then the average increases by 3 months. Find the age of the teacher.

   A. 22 YRS
   B. 23YRS
   C. 24YRS
   D. 25YRS

Q12. A clock is set right at 6 a.m. The clock loses 16 minutes in 24 hours. What will be the true time when the clock indicates 10 p.m. on 4th day?

   A. 10.30 PM
   B. 11.00 PM
   C. 11.30 PM

D. 12.00 AM

E. 12.00 PM

Q13. In how many ways, a committee of 5 members can be selected from 6 men and 5 ladies, consisting of 3 men and 2 ladies?

A. 180

B. 200

C. 220

D. 240

E. NONE OF THESE

Q14. How many words can be formed from the letters of the word 'EXTRA' so that the vowels are never together?

A. 720

B. 840

C. 72

D. 84

E. 36

Q15. log 2=.30103,find the number of digits in 2^{56}

A. 15

B. 16

C. 17

D. 18

E. NONE OF THESE

Q16. A and B can do a piece of work in 21 and 24 days respectively. They start the work together and after some days A leaves the work and B completes the remaining work in 9 days. After how many days did A leave?

A. 5

B. 7

C. 8

D. 6

Q17. In a 100 M race, if A gives B a start of 20 meters, then A wins the race by 5 seconds. Alternatively, if A gives B a start of 40 meters the race ends in a dead heat. How long does A take to run 200 M?

A 10 seconds

B. 20 seconds

C. 30 seconds

D. 40 seconds

Please read the following questions 18 to 30. Four options (A, B, C, D) are given as possible answer to the question asked. Please choose the correct answer option.

18. What number should replace the question mark?
    52, 25, 77, 77,?, 451, 605

A-154
B-152
C-150
D-149

19. How many minutes is it before 12 noon if 8 minutes ago it was three times as many minutes past 9
    AM?

A-42 minutes
B-40 minutes
C-43 minutes
D-40 minutes

20. Mr. B has Rs.60.00 more than Mr.A, but then Mr.A has a win on lottery and trebles his money, which means that he now has Rs.40.00 more than the original amount of money that the two men had between them. How much money did Mr.B and Mr.A have between them before Mr.A 's win?

A Rs 100
B Rs 160
C Rs 180
D Rs.260

21. What number should replace the question mark?

8	2	4	2	106
7	5	3	9	132
7	8	1	2	153
3	9	5	6	131
8	1	2	7	99
9	3	1	7	?

A- 121
B- 128
C- 130
D- 126

22. The ages of five family members total 169 between them:
    M and S total 98 between them.
    S and R total 90 between them.
    R and J total 50 between them.

J and G total 33 between them.
How old is each family member?

A- M 44, S 53, R 40, J 10, G 24
B-M 46, S 52, R 38, J 12, G 21
C- M 41, S 54, R 39, J 9, G 25
D- M 50, S 54, R 38, J 11, G 27

23. Four explorers deep in the jungle have to cross a rope bridge in the middle of a moonless night. Unfortunately the bridge is only strong enough to support two people at a time. Also, because deep in the jungle on a moonless night it is pitch black, he explorers need a torch to guide them, Otherwise there is every possibility they would stumble and plunge to their deaths in the ravine below. However, between them they have only one torch. Young M can cross the ravine in 2 minutes, his sister N can cross in 3 minutes, their mother H can cross in 5 minutes; however, old C can only hobble across in 10 minutes. How quickly is it possible for all four to reach the other side?

A-21 Minutes
B-22 Minutes
C-19 Minutes
D-20 Minutes

24. The average of three numbers is 17.The average of two of these three numbers is 17.5.What is the value of the third number?

A-12
B-18
C-16
D-15.5

25. S, H and P have Rs.168.00 between them. The combined amount of money that S and H have is twice as much as P .The combined amount of money that H and P have is the same as S has. How much money has each?

A-S Rs.84.00, P Rs.56.00, H Rs.28.00
B- S Rs.80.00, P Rs.50.00, H Rs.30.00
C- S Rs.90.00, P Rs.60.00, H Rs.40.00
D- S Rs.81.00, P Rs.53.00, H Rs.32.00

26. Find five consecutive numbers below that total 23:
947251739244572561854

A: 72517
B: 45725
C: 94725
D: 44572

27. 368421   is to   638241
    And   749135   is to   479315
    Therefore   841263   is to   ?

A: 481623
B: 496132
C: 941632
D: 182634

28.   My watch was correct at midnight after which it began to lose 14 minutes per hour until 7 Hours ago it stopped completely. It now shows the time as 3.50 am. What now is the correct time?
A: 1 PM
B: 11AM
C: 12 NOON
D: 11.50AM

29.   Identify two numbers between 1 and 60 which both meet all the following conditions:
   - They are divisible by 3
   - When the digits are added together the total is between 4 and 8
   - They are odd numbers
   - When the digits are multiplied together the total is between 4 and 8.

A: 13 AND 33
B: 21 AND 27
C: 15 AND 51
D: 15 AND 21

30. L and K share the same birthday. L is three times as old as K is now, but in five years' time she will only be twice as old. How old was L when she was six times as old as K?

A: 9
B: 12
C: 6
D: 18

English and Verbal Ability

Read the following comprehension. Four options are given as possible answers to the statements given in each question 31 to 35. Choose the correct answer option for each question.

It still remains to speak of one of the principal causes which make diversity of opinion advantageous, and will continue to do so until mankind shall have entered a stage of intellectual advancement which at present seems at an incalculable distance. We have hitherto considered only two possibilities that the received opinion may be false, and some other opinion, consequently, true; or that, the received opinion being true, a conflict with the opposite error is essential to a clear apprehension and deep feeling of its truth. But there is a commoner case than either of these :when the conflicting doctrines ,instead of being one true and the other false , share the truth between them; and the nonconforming opinion is needed to supply the remainder of the truth, of which the received doctrine embodies only a part. Popular opinions, on subjects not palpable to sense, are often true, but seldom or never the whole truth. They are a part of the truth; sometimes a greater, sometimes a smaller part, but exaggerated, distorted, and disjointed from the truths by which they ought to be accompanied and limited. Heretical opinions ,on the other hand ,are generally some of these suppressed and neglected truths, bursting the bonds which kept them down , and either seeking reconciliation with the truth contained in the common opinion , or fronting it as enemies , and setting themselves up , with similar exclusiveness, as the whole truth .The latter case is hitherto the most frequent ,as in the human mind ,one-sidedness has always been the rule ,and many sidedness the exception .Hence, even in revolutions of opinion ,one part of the truth usually sets while another rises. Even progress, which ought to super-add, for the most part only substitutes, one partial and incomplete truth for another; improvement consisting chiefly in this ,that the new fragment of truth is more wanted ,more adopted to the needs of the time ,than that which it displaces. Such being the partial character of prevailing opinions, even when resting on a true foundation, every opinion which embodies somewhat of the portion of truth which the common opinion omits and confusion that truth may be blended .No sober judge of human affairs will bound to be indignant because those who force on our notice truths which we should otherwise have overlooked, overlook some of those which we see. Rather, he will think that so long as popular truth is one-sided, it is more desirable than otherwise that unpopular truth should have one4-sided assertors too; such being usually the most energetic, and the most likely to compel reluctant attention to the fragment of wisdom which they proclaim as if it were the whole.

31. According to the author
   i. Diversity of opinion will always be advantageous
   ii. There was a time when diversity of opinion was not advantageous
   iii. Diversity of opinion is a natural phenomenon
   iv. Given a certain degree of intellectual advancement, diversity of opinion can cease to be advantageous

   Answer: A: (i) and (iii) , B: (ii) and (iv), C: (ii), D (iv)

32. The author is making out a case for
   i. Regarding both received opinion and its opposite as true
   ii. Conflicting doctrines and a nonconformist view, being regarded as complementary to each other
   iii. Seeking truth in a nonconformist view ignoring both received opinion and its opposite
   iv. Working for a time when diversity of opinion will cease to be advantageous

A (i)
B (ii)
C (iii)
D (iv)

33. The best thing to do is to
   i. Let popular opinions undiluted by heresies
   ii. Let heretical opinions prevail unchallenged by popular ones
   iii. Let an open mindedness given to many –sidedness develop
   iv. Strike a balance between received opinion and its opposite

   A: (i) and (iv),
   B (ii) and (iii),
   C (iii) and (iv),
   D (iii)

34. The author believes that

   i. Revolutions of opinion always reveal the whole truth
   ii. Even a small shred of truth though mixed with error should be deemed a precious addition
      to partially true popular opinions
   iii. What is called progress always results in the discovery of truth in its entirety
   iv. Truth can be revealed only when a complete unanimity of opinion and belief is achieved by mankind

   A: (i) and (iv),
   B (ii) and (iii),
   C(iii) ,
   D (iv)

35. The best title for the above extract will be
   i. Popular opinions are never right
   ii. Importance of many-sidedness and openness of mind
   iii. Let contending views prevail
   iv. Truth avoids extremes, the Middle Path is the best.

   A: (ii),
   B (i),
   C (iii),
   D (iv)

Direction for questions 36 to 40: In each question, the word at the top is used in four different ways, numbered (a) to (d) .Choose the option in which the usage of the word is *Incorrect or Inappropriate*.

36. SORT

(a) Let's sort these boys into four groups.

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(b) They serve tea of a sort on these trains.

(c) Farmers of all sort attended the rally.

(d) What sort of cheese do you use in pizza?

37. HOST

(a) A virus has infected the host computer.

(b) Ranchi will play the host to the next national film festival.

(c) Kerala's forests are host to a range of snakes.

(d) If you host the party, who will foot the bill.

38. IMPLICATION

(a) Death, by implication, is the only solution the poem offers the reader.

(b) Several members of the audience missed the implication of the minister's promise.

(c) This letter will lead to the implication of several industrialists in the share market scam

(d) Everyone appreciated the headmaster's implication in raising flood relief in the village.

39. DISTINCT

(a) Mars became distinct on the horizon in the month of August.

(b) The distinct strains of Ravi's violin could be heard above the general din.

(c) He is distinct about what is right and what is wrong.

(d) Ghosh babu's is a distinct case of water rising above its own level.

40. BUNDLE

(a) He made a bundle in the share market.

(b) It was sheer luck that brought a bundle of boy scouts to where I was lying wounded.

(c) The newborn body was a bundle of joy for the family.

(d) Mobile operators are offering a bundle of additional benefits.

Direction for questions 41 to 44: Each of the following questions has a sentence with two blanks. Given below each question are five pairs of words. Choose the pair that best completes the sentence.

41. The genocides in Bosnia and Rwanda, apart from being mis-described in the most sinister and _____ manner as ' ethnic cleansing', were also blamed , in further hand-washing rhetoric , on something dark and interior to _____and perpetrators alike.

(a) innovative; communicator

(b) enchanting ; leaders

(c) disingenuous ; victims

(d) exigent; exploiters

(e) tragic; sufferers

42. As navigator s, calendar makers, and other _____of the night sky accumulated evidence to the contrary, ancient astronomers were forced to _____that certain bodies might move in circles about points, which in turn moved in circles about the earth.

(a) scrutinizers ; believe

(b) observers ; agree

(c) scrutinizers ; suggest

(d) observers ; concede

(e) students ; conclude

43. Every human being, after the first few days of his life, is a product of two factors: on the one hand , there is his _____endowment ; and on the other hand , there is the effect of environment , including_____.

(a) constitutional ; weather

(b) congenital ; education

(c) personal ; climate

(d) economic ; learning

(e) genetic ; pedagogy

44. Exhaustion of natural resources, destruction of individual initiative by governments, control over men's minds by central _____ of education and propaganda are some of the major evils which appear to be on the increase as a result of the impact of science upon minds suited by _____ to an earlier kind of world.

(a) tenets; fixation

(b) aspects ; inhibitions

(c) institutions ; inhibitions

(d) organs; tradition

(e) departments ; repulsion

Directions for Questions 15 to 18 : Each of the following questions has a paragraph with one italicized word that does not make sense. Choose the most <u>appropriate</u> replacement for that word from the options given below the paragraph.

45. Intelligent design derives from an early 19th –century explanation of the natural world given by an English clergyman, William Paley. Paley was the populariser of the famous watchmaker analogy . Proponents of intelligent design are *crupping* Paley's argument with a new gloss from molecular biology.

(a) destroying

 (b) testing

(c) resurrecting

 (d) questioning

46. Women squat , heads covered, beside huge piles of limp fodder and *blunk* oil lamps ,and just about all the cows in the three towns converge upon this spot. Sinners, supplicants and yes even scallyw3ags hand over a few coins for a crack at redemption and a handful of grass.

(a) shining

 (b) bright

 (c) sputtering

 (d) effulgent

47. It is *klang* to a sensitive traveler who walks through this great town , when he sees the streets , the roads , and cabin doors crowded with beggars , mostly women, followed by three, four ,or six children ,all in rags and importuning every passenger for alms.

(a) amusing

(b) irritating

 (c) disgusting

 (d) distressing

48. Or there is the most *fingummy* diplomatic note on record: when Phiplip of Macedon wrote to the Spartans that, if he came within their borders, he would leave not one stone of their city, they wrote back the one word-"If".

(a) witty

(b) rude

(c) simple

 (d) terse

49. The latest negotiations came to a sudden close with the . . . of renewed agitation.

> A. demand
> B. threat
> C. note
> D. call

50. A large number of ... career women are unhappy at the lack of childcare facilities.

> A. desiring
> B. desirous
> C. would - be
> D. willing

Section 3 (Descriptive Section)

Total Marks 30. Each question carries 15 marks

Critically comment on ANY TWO of the following topics. Word limit (200 words each)

- <u>Morals</u> and values of Indians are degenerating.
- Foreign Direct Investments: Boon or bane.
- Women are equal to men, and do not need any reservations.
- Social media: 24X7 communication, but absolute isolation.
- River Ganges: Pure or impure.
- Leaders are born, and cannot be produced in business schools.
  Cases of domestic violence go unnoticed as they fail to get reported

  Space for Rough work

The End