Ph. D. Entrance Test – 2015
Subject: Information Technology
Paper – I

Important: *Please consult your Admit Card/Roll No. slip before filling your Roll Number on the Test Booklet and Answer Sheet.*

Roll No.   *In Figure*   *In Words*

O.M.R. Answer Sheet Serial No.

Signature of Candidate: _____   *Signature of Invigilator:* _____

Time: 60 Minutes   Number of Questions: 50   Maximum Marks: 50

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO.

INSTRUCTIONS:

1. Write your Roll No. on the Questions Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Question Booklet Serial No. on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point/Black Gel Pen.**
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. Please check that this Question Booklet contains 50 Questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of Test.
5. Each question has four alternative answer (A,B,C,D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point/Black Gel Pen. There shall be no negative marking for wrong answers.**
6. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Booklet. No marks will be deducted in such cases.
7. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the question given in the Question Booklet.
8. If you want to change an already marked answer, erase the shade in the darkened bubble completely.
9. For rough work only the blank sheet at the end of the Question Booklet be used.
10. The Answer Sheet is designed for computer evaluation. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e. not following the instructions completely, shall be of the candidate only.**
11. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
12. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so would be expelled from the examination.
13. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistant or found giving or receiving assistant or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
14. **Communication equipment such as mobile phones, pager, wireless set, scanner, camera or any electronic/digital gadget etc., is not permitted inside the examination hall. Use of calculators is not allowed.**
15. The candidates will not be allowed to leave the Examination Hall/Room before the expiry of the allotted time.

1. Why is the XOR problem exceptionally interesting to neural network researchers?
   A) Because it can be expressed in a way that allows you to use a neural network
   B) Because it is complex binary operation that cannot be solved using neural networks
   C) Because it can be solved by a single layer perceptron
   D) Because it is the simplest linearly inseparable problem that exists.

2. The machine independent phases of the compiler:
   A) Syntax Analysis
   B) Lexical Analysis
   C) Intermediate code generation
   D) All of the above

3. Where is the minimum criteria used in fuzzy logic:
   A) In AND operation
   B) in OR operation
   C) In De-Morgan's Theorem
   D) None of above

4. The truth values of traditional set theory is _____ and that of fuzzy set is _____
   A) Either 0 or 1, between 0 & 1
   B) Between 0 & 1, either 0 or 1
   C) Between 0 & 1, between 0 & 1
   D) Either 0 or 1, either 0 or 1

5. A software that uses mathematical functions to simulate an evolutionary process is known as
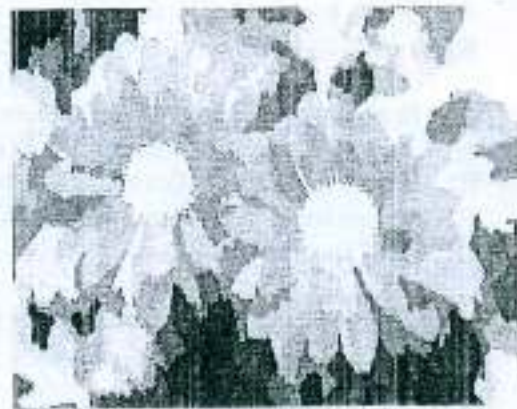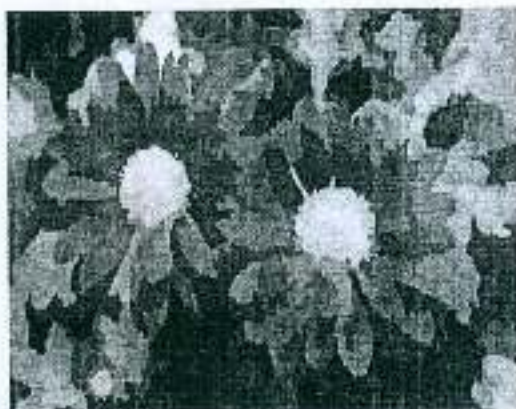   A) Neural Network
   B) Fuzzy Logic
   C) Intelligent Agent
   D) Genetic Algorithm

6. To reduce computation if one utilizes non-overlapping regions in image processing, it usually produces _____ effect.
   A) Dimming
   B) Blurred
   C) Blocky
   D) None of the mentioned

7. Histogram equalization makes image intensity changes
   A) Low
   B) High
   C) Visible
   D) Invisible

8. In order to obtain the image in above Figure on the right from the original image in Figure on left, the following operation should be applied:
   A) Contrast compression
   B) Image Inversion
   C) Histogram equalization
   D) Extraction of the most significant bits

9. For line detection we use mask that is
   A) Gaussian   B) Laplacian   C) Ideal   D) Butterworth

10. Morphological closing operation is represented by
    A) A. B   B) A – B   C) A-B   D) A x B

11. Hue and saturation, both together produce
    A) Brightness   B) Transitivity   C) Chromaticity   D) Reflectivity

12. You wish to install a hardware device that is not Plug and Play. Which of the following is commonly the first instruction given in User Manual to install this device?
    A) Install the driver   B) Install the device
    C) Turn the power off   D) Disconnect the monitor

13. Which of the following would best fit the following description -- software is copied and given to a friend without the permission of the copyright owner?
    A) Freeware   B) Piracy   C) Shareware   D) Public domain

14. A program is written to turn on/off a switch. The switch is switched off once the temperature falls below 16 and then it is turned on when the temperature is more than 25. To test this program, identify the Equivalence values which belong to the same class.
    A) 12,16,22   B) 24,27,17   C) 26,27,28   D) 14,15,19

15. Match the following:
    a) IPv4 Address   (i) Size is 16-bit
    b) IPv6 Address   (ii) Size is 48-bit
    c) MAC Address   (iii) Size is 32-bit
    d) Port Number   (iv) Size is 128-bit

    A) a)-(iv) b)-(i) c)- (ii) d)-(iii)   B) a)-(iv) b)-(i) c)- (iii) d)-(ii)
    C) a)-(iii) b)-(ii) c)- (iv) d)-(i)   D) a)-(iii) b)-(iv) c)- (ii) d)-(i)

16. Match the following:
    A) FTP   (i) Protocol for sending electronic mail on the Internet.
    B) TELNET   (ii) Unique address of any web resource
    C) URL   (iii) Protocol to exchange file between two computers
    D) SMTP   (iv) Protocol that allow user on one computer to log into another computer

    A) a)-(iv) b)-(i) c)- (ii) d)-(iii)   B) a)-(iv) b)-(i) c)- (iii) d)-(ii)
    C) a)-(iii) b)-(ii) c)- (iv) d)-(i)   D) a)-(iii) b)-(iv) c)- (ii) d)-(i)

17. In order to enhance performance of the computer, Disk defragmenter
    A) Consolidates parts of files lying at different locations on computer's hard disk
    B) Deletes temporary files related to Internet
    C) Deletes temporary files related to backup
    D) All of the above

18. Which of the following optical transducer is an active transducer?
    A) Photo emissive cell   B) Photo diode
    C) Photo transistor   D) Photo voltaic cell

19. Function points provide an objective measure of the application system -----------that can be used to compare different kinds of application systems.

    A) Size   B) Complexity   C) Performance   D) Operation ease

(2)

20. The noise at the input to an ideal frequency detector is white. The detector is operating above threshold. The power spectral density of the noise at the output is
    A) Raised-cosine   B) Flat   C) Parabolic   D) Gaussian

21. A method of ensuring electronic document integrity
    A) Firewall   B) SSL   C) Authentication   D) Digital Signatures

22. Order the following list by their asymptotic growth (fastest to slowest)
    (i) n   (ii) n^2 (iii) log n   (iv) n !   (v) n log n

    A) iii – i – v – iv – ii   B) ii – i – v – iv – iii
    C) iii – i – v – ii – iv   D) iii – v – i – iv – ii

23. Which of the following tag in HTML is used to add a row to a table
    A) <td>   B) <row>   C) <tuple>   D) <tr>

24. With SQL, how can you insert "PhD" as the "Course" in the "Students" table assuming other values to be NULL?
    A) INSERT ('Phd') INTO Students (Course)
    B) INSERT INTO Students (Course) VALUES ('PhD')
    C) INSERT INTO Students (Course) 'PhD'
    D) INSERT INTO Students ('PhD') INTO Course

25. Look at this series: 7, 10, 8, 11, 9, 12, ... What number should come next?
    A) 7   B) 10   C) 12   D) 13

26. Three unbiased coins are tossed. What is the probability of getting at most two heads?
    A) 3/4   B) 1/4   C) 3/8   D) 7/8

27. Normal distribution theory tells us that for large samples, 95% of sample means lie within how many standard deviations above and below the population mean?
    A) 1.96   B) The square root of the sample size
    C) Equal to z-score   D) 95

28. Which of the following features will characterize an OS as multiprogrammed OS?
    (a) More than one program may be loaded into main memory at the same time.
    (b) If a program waits for certain event another program is immediately scheduled.
    (c) If the execution of a program terminates, another program is immediately scheduled.

    A) (a) only   B) (a) and (b) only
    C) (a) and (c) only   D) All (a), (b) and (c)

29. What one of the following is the component of an ER model?
    A) Entities   B) Relationships   C) Attributes   D) All of these

30. How can you make an e-mail link in HTML?
    A) <mail>pu@pu.ac.in</mail>   B) <a href ="mailto:pu@pu.ac.in">
    C) <a href="pu@pu.ac.in">   D) <mail href="pu@pu.ac.in">

31. "Cloud" in cloud computing represents what?
    A) Wireless   B) Hard drives   C) People   D) Internet

32. The web browser's _____ keeps a list of web pages that a user visited during certain time period.
    A) History   B) Cache   C) Favorites   D) Bookmark

33. Beta testing of a software product is done by
    A) Developer   B) User   C) Tester   D) Business Analyst

34. Which of the following statement is false
    A) Data dictionary is also known as system catalog.
    B) The information stored in data dictionary is called meta data.
    C) Data dictionary is a centralized store of information about the database.
    D) Data dictionary stores information contained in various tables of the database.

35. In HTML page, which of the following tag is generally not written in <head> tag
    A) Title   B) Table   C) Meta   D) Script

36. Consider the following function in C:

```
Test ( int t1) {
        if (t1 == 0)    return 0;
        else    return t1 += Test(t1 – 1);
}
```

When the above function is called with a non-zero positive value, it always returns value of
    A) t1   B) t1-1   C) $t1*(t1+1)/2$ D) Zero

37. Recursive descent parsing is an example of:
    A) Top down parsing   B) Bottom-up parsing
    C) Predictive parsing   D) None of these

38. A class in c++ cannot be
    A) Virtual   B) Generic   C) Inline   D) Friend

39. Which of the following is most likely to be the time required to retrieve a block from a hard disk?
    A) 100 milliseconds   B) 10 milliseconds   C) 1 millisecond   D) 100 microseconds

40. TCP header does not contain the following fields:
    A) Source and destination address   B) Source and destination port
    C) Acknowledgement number   D) Flags

41. Which aspect of security is at risk when unauthorized people can read data from your e-mail?
    A) Confidentiality   B) Integrity
    C) Availability   D) Authentication

42. What is spam e-mail?
    A) Unsolicited commercial/non-commercial e-mail
    B) A Usenet archive
    C) A computer virus in e-mail
    D) Hacking algorithm

43. Assume the URL: https://www.google.com/login
    Correct URL is:
    A) http://www.google.com/login   B) https://google.com/login
    C) http://google.com/login   D) Assumed URL is correct

44. Following table indicates typical values of various storage means for currently available laptops.

Type	RAM	Hard Disk
Capacity	X	Y

X and Y can be respectively,

A) 4GB, 500GB   B) 2MB, 300MB   C) 2KB, 300KB   D) 2TB, 300TB

45. You perform banking operations online. Which of the following are application-level encryption protocols that you would most likely use to securely bank online?
A) SSL and SET   B) Verisign and SHA1
C) READY, SET, and GO   D) PGP, PEM, and SSL

46. What is the meaning of putting your laptop using MS-Windows operating system in hibernate state?
A) Stores open files & settings in RAM and goes to sleep mode
B) Stores open files & settings in RAM and turn-off the laptop
C) Stores open files & settings in Hard-disk and goes to sleep mode
D) Stores open files & settings in Hard-disk and turn-off the laptop

47. Which is not one of the three main categories of cloud computing services?
A) Infrastructure-as-a-Service (IaaS)
B) Platform-as-a-Service (PaaS)
C) Communication-as-a-Service (CaaS)
D) Software-as-a-Service (SaaS)

48. What does a lock symbol mean in the address bar of a web browser?
A) It shows that current URL is locked.
B) It indicates that the identity of URL proved by some third party.
C) It just a graphical symbol.
D) It indicates that URL is a fake link.

49. Which of the following description is closest to open source software?
A) It is software whose source code is available for modification/ enhancement by anyone free of cost.
B) It is software which can be freely used by any number of users.
C) It is software for which user has to pay money and then can share with anybody.
D) It is software which cannot be installed on computers.

50. Cookies were designed as a response to which problem in the original design of HTML and HTTP?
A) Persistence of state between web-sessions
B) Inequality in information between clients and servers
C) The open and distributed nature of the Internet
D) Lack of privacy and confidentiality in viewing web-pages

x-x-x