Candidates should open the top side of the seal of this Booklet and take out the OMR Answer Sheet placed between page no. 2 and 3.

Test Booklet No. :

A4-R5 : Internet of Things and Its Applications

Test Booklet Series : 21

Time Allowed : 2 Hours

Maximum Marks : 100

Roll No. :

Answer Sheet No. :

Read the following instructions carefully before you begin to answer the questions.

Name of Candidate : _____   **Signature of Candidate :** _____

1. During embedded design, which design considers both hardware and software ?

   (A) Memory Design

   (B) Software / hardware Design

   (C) Platform-based Design

   (D) Peripheral Design

2. Which of the following is used to upload the Arduino Sketches to the board ?

   (A) avrgcc   (B) g++

   (C) cpython   (D) avrdude

3. Which processor helps in carrying out floating point calculations ?

   (A) microprocessor (B) coprocessor

   (C) microcontroller (D) controller

4. What is the size of RAM memory in 8051 ?

   (A) 32 bytes   (B) 64 bytes

   (C) 128 bytes   (D) 256 bytes

5. Identify the polite method of beginning a business letter.

   (A) We are forced to refuse

   (B) We demand to know from you

   (C) We find it difficult to believe

   (D) We appreciate your prompt reply

6. If 1 means an object is detected and 0 meaning no object is detected, then considering the sensor stationary, what can be the possible movement of object if the output by the sensor is observed as 111000 ?

   (A) Object is stationary

   (B) Object is oscillating side by side

   (C) Object is moving away

   (D) Object is moving closer

7. What is the outcome of the following Arduino code ?

   ```
   void setup() {
   Serial.begin(9600);
   }
   void setup() {
   Serial.write(20);
   }
   ```

   (A) Send a signal to pin 20 on the Arduino board

   (B) Send a octal number of 20 through the Serial pins

   (C) Send a byte with value 20 through the Serial pins

   (D) Send a hexadecimal number of 20 through the Serial pins

8. What is the use of the Interrupt Service Routine in an Arduino ?

   (A) To boot up the Arduino

   (B) To exit any code that is running

   (C) To automate functions

   (D) To make more memory

9. What will be the output of the following code ?

   ```
   #include <stdio.h>
   void solve() {
   int b = 4;
   int res = b++ + ++b + ++b;
   printf("%d", res);
   }
   int main() {
   solve();
   return 0;
   }
   ```

   (A) 12   (B) 15

   (C) 17   (D) 20

10. While presenting using projectors, information line can be revealed by using an _____ sheet to over the _____.
(A) Transparent, slide
(B) Translucent, transparency
(C) Opaque, flip chart
(D) Opaque, transparency

11. Which of the following prevents someone from denying the accessed resource ?
(A) Accounting
(B) Non-repudiation
(C) Sniffing
(D) Authorization

12. How many times does the setup() function run on every startup of the Arduino System ?
(A) 4 (B) 5
(C) 2 (D) 1

13. How to research and enquire about the company ?
(A) Website
(B) Company Directories
(C) Annual Report
(D) All of these

14. How can you throw an error with preprocessor directives to Arduino Compiler, forcing to stop compilation ?
(A) #warning (B) #stop
(C) #cut (D) #error

15. How should the tone of a speaker be like ?
(A) Loud (B) Clear
(C) Low (D) Soft

16. _____ is a combination of hardware and software to perform a specific task.
(A) IoT System
(B) Embedded System
(C) Grid System
(D) Cloud System

17. Reports are usually utilized to present the outcome of :
(A) Experiment (B) Inquiry
(C) Investigation (D) All of these

18. The actuators used in IoT applications are :
(A) Relay (B) Servo Motors
(C) DC Motors (D) All of these

19. Which of the following is false about IoT devices ?
(A) Use internet for collecting and sharing data
(B) Need microcontrollers
(C) Use wireless technology
(D) Are completely safe

20. LDR sensor works on the principle of :
(A) Resistivity
(B) Photoconductivity
(C) Conductivity
(D) Both (A) and (C)

21. Which of the following is the key to an effective presentation ?
(A) Image
(B) Styles
(C) Limited words and key phrases
(D) Layouts

22. Which one of these is not threat modelling methodology ?
(A) NANO (B) STRIDE
(C) OCTAVE (D) PASTA

23. The purpose of communication is to help officials to _____ the employees.
(A) Eliminate (B) Motivate
(C) Threaten (D) Apprise

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24. Sensor effectiveness depends on which of the following parameters ?
(A) Radiation (B) Resistivity
(C) Sensitivity (D) All of the above

25. The IoT networks that has a very short range is :
(A) WAN
(B) LAN
(C) Fox
(D) Short-range Wireless Network

26. Which memory storage is widely used in Embedded Systems ?
(A) EEPROM (B) DRAM
(C) Flash memory (D) SRAM

27. A set of homogenous data stored in consecutive memory locations is called :
(A) List (B) Structure
(C) Array (D) Union

28. IoT devices can easily lead to catastrophe without _____.
(A) Software
(B) Devices
(C) Cloud
(D) Management system

29. What is the bit size used in 8051 ?
(A) 4-bit (B) 8-bit
(C) 16-bit (D) 32-bit

30. An IoT network is a collection of _____ devices.
(A) Signal
(B) Machine to machine
(C) Interconnected
(D) Network

31. What is the use of the IR Sensor ?
(A) Humidity Detection
(B) Image Processing
(C) Object Detection
(D) GPS

32. Which of the following helps to collaborate in IoT development ?
(A) physical computing
(B) chemical computing
(C) mechanism
(D) cloud computing

33. Which of the following is NOT a data type ?
(A) sbit (B) dbit
(C) bit (D) unsigned int

34. The process of assessment of the speaker's content while listening is called _____.
(A) Critical listening
(B) Dialogic listening
(C) Comprehensive listening
(D) Systematic listening

35. The process of removing certain band of frequencies from a signal while permitting other is called as _____.
(A) Attenuation
(B) Distortion
(C) Filtering
(D) None of the above

36. What is the feeling of competence to cope with life's challenges and of being worthy of happiness called ?
(A) Arrogance
(B) Self-esteem
(C) Self-efficacy
(D) Wishful thinking

37. What will be the output of the following code ?
```
#include <stdio.h>
void solve() {
 char ch[5] = "abcde";
int ans = 0;
for(int i = 0; i< 5; i++) {
ans += (ch[i] - 'a');
 }
printf("%d", ans);
}
int main() {
solve();
return 0;
}
```
(A)   5   (B)   20
(C)   40   (D)   10

38. What is the objective of the code given below if it is executed on the Arduino Uno ?
```
#include<EEPROM.h>
int pin=13;
void setup() {
pinMode(pin,OUTPUT);
Serial.begin(9600);
}
void loop() {
for(int i=0; i<EEPROM.length(); i++) {
EEPROM.write(i, 1);
 }
digitalWrite(pin,HIGH);
exit(0);
}
```
(A)   Clear EEPROM
(B)   Fill EEPROM with 1's
(C)   Export EEPROM data
(D)   Fill EEPROM with 0's

39. The scope that hacker can use to break into a system is called as :
(A)   Attack surface
(B)   Defense
(C)   Principle of least privilege
(D)   Risk mitigation

40. What is the number of elements in open IoT architecture ?
(A)   Four   (B)   Five
(C)   Six   (D)   Seven

41. Which of the following must be present in a microcontroller ?
(A)   CPU, ROM, I/O ports and timers
(B)   RAM, ROM, I/O ports and timers
(C)   CPU, RAM, I/O ports and timers
(D)   CPU, RAM, ROM, I/O ports and timers

42. Which rule is used to decide the direction of rotation of DC motor ?
(A)   Coulomb's Law
(B)   Lenz's Law
(C)   Fleming's Right-hand Rule
(D)   Fleming's Left-hand Rule

43. A good presenter and communicator should :
(A)   Follow good sequencing of ideas
(B)   Manage time properly
(C)   Clear doubts
(D)   All of these

44. How are multiline comments denoted in Embedded C ?
(A)   ##   (B)   /* */
(C)   % %   (D)   //

45. How power supply is done to Raspberry Pi ?
(A)   USB connection (B)   Internal battery
(C)   Charger   (D)   Adapter

46. The Atmega 168 is an _____ bit chip.
(A)   32   (B)   64
(C)   8   (D)   16

47. Most sensors have what type of transfer function ?
(A)   Zero   (B)   Infinity
(C)   Linear   (D)   Non-linear

48. How many analog pins are used in Arduino Mega board ?
(A) 12   (B) 16
(C) 8   (D) 14

49. Which of the following is the property of embedded C language ?
(A) Hardware independent
(B) Used for web applications
(C) Used with limited resources
(D) Used for native development

50. Which of these does not enhance listening skills ?
(A) Attention
(B) Clear perception
(C) Frankness
(D) Ignoring

51. IoT and cloud computing has what kind of relationship ?
(A) Physical
(B) Complementary
(C) Graphical
(D) Coding

52. What is the correct execution process of an Arduino code ?
(A) Preprocessor->Editor->Compiler
(B) Editor->Preprocessor->Compiler
(C) Compiler->Preprocessor->Editor
(D) Editor->Compiler->Preprocessor

53. Which one is not Leading Cloud Services for IoT Deployments ?
(A) AWS   (B) IBM Watson
(C) Microsoft Azure (D) Google Drive

54. Which type of variables are retained for use throughout the program in RAM and not reallocated during program execution ?
(A) Automatic   (B) Static
(C) Dynamic   (D) All of these

55. What language is the Arduino IDE built on ?
(A) Java   (B) HTML
(C) C/C++   (D) Python

56. Which of the following process is used to keep track of user's activity ?
(A) Authentication
(B) Authoring
(C) Authorization
(D) Accounting

57. What is the effect of performing AND operation of R with 0xFE ?
(A) Setting a selected bit of R
(B) Clearing a selected bit of R
(C) Complement selected bit of R
(D) None of these

58. What is the real example of a smart grid device in IoT ?
(A) Mobile phone   (B) Television
(C) Smart Speaker   (D) Smart Meters

59. _____ allow data processing close to device.
(A) Edge Computing
(B) Cloud Computing
(C) Fog Computing
(D) Grid Computing

60. Which one is not a control structure ?
(A) While   (B) If..else
(C) #define   (D) Case

61. Embedded C is :
(A) A subset of traditional C
(B) An extension of traditional C
(C) A superset of traditional C
(D) Same as traditional C

62. The advantages of using functions is _____.

(A) Partition larger task into smaller tasks

(B) Code reusability

(C) Manage complexity

(D) All of these

63. In IoT, Transport layer set up connections without handshakes/acknowledgements using :

(A) UDP   (B) TCP

(C) FTP   (D) HTTP

64. Which of the following is the basic functions of a timer ?

(A) Control the compare, capture mode

(B) Act as a counter

(C) Provide a time delay

(D) All of these

65. TCP stands for :

(A) Transmission Control Protocol

(B) Telecommunication Control Protocol

(C) Temperature Control Protocol

(D) Transmission and Communication Protocol

66. What are the major categories of communications ?

(A) Speech, writing

(B) Printing

(C) Electronic communication

(D) All of the above

67. Which one is the most discussed challenge in IoT ?

(A) Standard   (B) Security

(C) Regulation   (D) Internet

68. What type of signal does the analogWrite() function output ?

(A) Pulse Code Modulated Signal

(B) Frequency Modulated Signal

(C) Pulse Width Modulated Signal

(D) Pulse Amplitude Modulated Signal

69. Mr. Rahul is seeking feedback after completing and implementing his project. This act represents :

(A) Time-Management

(B) Self-Awareness

(C) Gratitude

(D) Self-Love

70. Which of the following devices are specifically being used for converting serial to parallel and from parallel to serial respectively ?

(A) microcontroller   (B) timers

(C) counters   (D) registers

71. The main objective of WoT (Web of Things) is _____.

(A) Improve usability and interoperability

(B) Reduce the security

(C) Complicate the development

(D) Increase the cost

72. What is the process to check whether previous stages of reading have been followed properly ?

(A) Survey   (B) Question

(C) Reading   (D) Review

73. Predict the output of the following code if the object is moving towards the sensor.

```
int op = 6;
int isBarrier = HIGH;
void setup() {
pinMode(op, INPUT);
Serial.begin(9600);
}
void loop() {
isBarrier = digitalRead(op);
if (isBarrier == LOW) {
Serial.println("1+");
}
else {
Serial.print("clear+");
}
delay(100);
}
```

(A) clear+clear+1+1
(B) 1+1+clear+1
(C) 1+1+clear+clear
(D) clear+clear+clear+clear

74. In the IoT network, Secure Shell (SSH) is :
(A) Gateway
(B) Secure network protocol
(C) Router
(D) Firewall

75. Functions can pass information in which of the following ways ?
(A) Value   (B) Reference
(C) Stack   (D) Both (A) and (B)

76. These applications take data or input from various devices and convert it into viable actions or clear patterns for human analysis _____.
(A) Real Time Analytics
(B) Data Collection
(C) Device Integration
(D) Real Time Collection

77. What will be the output of the following Arduino code ?

```
void main() {
int k = 0;
double d = 10.21;
printf("%lu", sizeof(k + d));
}
void loop() {}
```

(A) 10.21   (B) 8
(C) null   (D) 23

78. Which of the following is an established set of rules that determines how data is transmitted between different device in the same network ?
(A) Network connection
(B) TCP IP protocol
(C) Network protocol
(D) TCP protocol

79. Which of the following method is better for task swapping in the embedded systems ?
(A) time slice
(B) RMS
(C) cooperative multitasking
(D) pre-emptive

80. HC-05 is a Bluetooth module that can communicate in which mode ?
(A) Simplex   (B) Duplex
(C) Full-Duplex   (D) None of these

81. What type of speaker looks into the eyes of the audience ?
(A) Confident   (B) Impatient
(C) Rude   (D) Impolite

82. Which of these may convey arrogance ?
(A) Shoulder shrug
(B) Jointed fingertips
(C) Hands swinging loosely
(D) Pointed finger

83. Using lecturers and handouts, information is acquired via _____ whereas by using tutorials and conversations, information is acquired through _____.
(A) Students, tutors
(B) Other sources, tutors
(C) Tutors, fellow learners
(D) None of the above

84. _____ is meant for a specific group of people while _____ may be aimed for the general public.
(A) circular, notice (B) notice, memo
(C) notice, circular (D) memo, circular

85. Which of the following challenge arises when we use many devices on the same network ?
(A) Signaling
(B) Security
(C) Power Detection
(D) Power Consumption

86. The stress management technique based on mental exercises which to produces the relaxation response :
(A) Autogenic Technique
(B) Eating
(C) Sleeping
(D) Medicine intake

87. MQ-135 is a type of _____.
(A) Humidity sensor
(B) Gas sensor
(C) Light sensor
(D) Temperature sensor

88. Major Component of IoT is/are _____.
(A) Sensors
(B) Actuators
(C) Smart Applications
(D) All of the Above

89. Predict the output of the following code if the object is moving away from the sensor :

```
int op = 7;
int isBarrier = HIGH;
void setup() {
pinMode(op, INPUT);
Serial.begin(9600);
}
void loop() {
isBarrier = digitalRead(op);
 if (isBarrier == LOW) {
Serial.println("1+");
  }
 else {
Serial.print("clear+");
 }
delay(100);
}
```

(A) clear+clear+1+1
(B) 1+1+clear+clear
(C) clear+clear+clear+clear
(D) 1+1+clear+1

90. What are the functions preprocessor directive in Embedded C programming ?
(A) Tell compiler where to find symbols that are not present in program
(B) Give compiler instructions to compile the program
(C) Define variables
(D) Define functions

91. What is Arduino ?
(A) Programming language
(B) Image editing software
(C) Open-source electronics platform
(D) Text editor

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92. What are Arduino Codes are referred to ?
(A) sketches   (B) drawings
(C) links   (D) notes

93. Which of the following is used to capture data from the physical world in IoT devices ?
(A) Sensors
(B) Actuators
(C) Microprocessors
(D) Microcontrollers

94. _____ is heart of Computer system.
(A) Memory   (B) I/O
(C) Counter   (D) Processor

95. What is the resolution of the micros() function on the Arduino Nano ?
(A) 7 Microseconds   (B) 4 Microseconds
(C) 6 Microseconds   (D) 2 Microseconds

96. Spring Boot Actuator exposes operational information about running application using _____ endpoints.
(A) TCP   (B) HTTP
(C) IP   (D) FTP

97. What is the output of the following program ?
for(; ;)
{
 Statements
}
(A) Error
(B) Statements will run forever
(C) This an infinite loop
(D) Both (B) and (C)

98. What indicates to the reader the purpose of a letter ?
(A) Subject   (B) Body
(C) Address   (D) Salutation

99. What is the efficiency of the DC motor at maximum power ?
(A) 90%   (B) 100%
(C) Around 80%   (D) Less than 50%

100. How are comments denoted in Embedded C ?
(A) #   (B) %
(C) ;   (D) //

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