

# PUNJAB PUBLIC SERVICE COMMISSION

Competitive Examination (August-2015) for Recruitment of Scientific Officer  
(Ballistics) in the Department of Home Affairs & Justice, Punjab

READ INSTRUCTIONS BEFORE FILLING ANY DETAILS OR ATTEMPTING TO ANSWER THE QUESTIONS

Candidate's Name \_\_\_\_\_

Father's Name \_\_\_\_\_

Date of Birth        
DD MM YYYY

Category Code\*    
(\*as given in the admit card)

OMR Response Sheet No. \_\_\_\_\_

Roll No. \_\_\_\_\_

Booklet No.

000208

Candidate's Signature (Please sign in the box)

## INSTRUCTIONS

<p>1. The candidate shall NOT open this booklet till the time told to do so by the Invigilation Staff. However, in the meantime, the candidate can read these instructions carefully and subsequently fill the appropriate columns given above in CAPITAL letters. The candidate may also fill the relevant columns (other than the columns related to marking responses to the questions) of the Optical Mark Reader(OMR) response sheet, supplied separately.</p>	<p>9. The candidates shall be responsible to ensure that the responses are marked in correct manner and any adverse impact due to wrong marking of responses would be the responsibility of the respective candidate. The following are some of the examples of wrong marking of responses on the OMR response sheet.</p>
<p>2. Use only blue or black ball point pen to fill the relevant columns on this page. Use of fountain pen may leave smudges which may make the information given by the candidate here illegible.</p>	<p>10. The candidates, when allowed to open the question paper booklet, are advised to check the booklet to confirm that the booklet has complete number of pages, the pages printed correctly and there are no blank pages. In case there is any such error in the question paper booklet then the candidate should immediately bring this fact to the notice of the invigilation Staff and obtain a booklet of the same series as this one.</p>
<p>3. The candidate shall be liable for any adverse effect if the information given above is wrong or illegible.</p>	<p>11. The serial number of the new booklet should be entered in the relevant column of the OMR. The candidate should request the Invigilation Staff to authenticate the change in serial number of question booklet by obtaining the initials of the Staff on the corrected serial number of the question booklet.</p>
<p>4. The candidate must fill all the columns given above on this page and sign at the appropriate place.</p>	<p>12. The question paper booklet has 13 pages.</p>
<p>5. Each candidate is required to attempt 100 questions in 120 minutes, except for visually impaired candidates, who would be given 20 minutes extra, by marking correct responses on the OMR sheet which would be supplied separately to the candidates.</p>	<p>13. Each question shall carry three marks.</p>
<p>6. The candidate must write the following on the OMRs sheet: (a)Serial number of OMR sheet supplied to him/her for marking the responses to the questions. (b)Serial number of the question booklet Failure to do so may lead to cancellation of candidature or any other action which the Commission may deem fit.</p>	<p>14. There are four options for each question and the candidate has to mark the most appropriate answer on the OMR response sheet using blue or black ball point pen.</p>
<p>7. The candidate should darken the appropriate response to the question by completely darkening the appropriate circle/oval according to his/her choice of response i.e. a, b, c or d in the manner shown in the example below.</p>	<p>15. There is no negative marking for wrong answers or questions not attempted by the candidate.</p>
<p>8. Partly darkening the circle/oval on the OMR response sheet or using other symbols such as tick mark or cross would not result in evaluation of the response as the OMR scanner can only interpret the answers by reading the darkened responses in the manner explained in preceding paragraph. Darkening more than one circle/oval as response to a question shall also be considered as wrong answer.</p>	

## Scientific Officer (Ballistics)

1. Function of bullet ends by:
  - a) Manufacturing it
  - b) Penetrating a target
  - c) Shooting
  - d) Targeting it
  
2. Bore of a non-rifled weapon-cartridge is 16 means:
  - a) This cartridge contains 16 shots.
  - b) Diameter of this cartridge is 16 mms.
  - c) This cartridge is weighing 1/16 of a pound.
  - d) Diameter of this cartridge is equal to that of a Lead ball weighing 3/48 of a pound.
  
3. Which of the following are individualising characteristics that have the potential to establish the identity of the gun(s) involved?
  - a) The calibre of the spent cartridge case(s).
  - b) The twist direction of any rifling marks found on bullet(s) recovered from the scene.
  - c) The pattern of minute parallel striations that make up the mark made by a particular rifling land on bullet(s) recovered from the scene.
  - d) The exact relative positions of extractor and ejector marks on the spent cartridge case(s).
  
4. Which one of the following is used for the analysis of the presence of gunshot residues?
  - a) Refractive index measurements.
  - b) Polarized light microscopy.
  - c) Microspectrophotometry.
  - d) Scanning electron microscopy used in conjunction with energy dispersive X-ray analysis.
  
5. A lady was shot by a revolver at a distance of 2m , inlet would be :
  - a) Inverted edge
  - b) Large than exit
  - c) Blackened
  - d) Regular in shape
  
6. Greener guns are :
  - a) Non rifled weapon
  - b) Long non rifled weapon
  - c) Fire shots
  - d) Long rifled weapon
  
7. Which one of the following are non-rifled:
  - a) revolvers
  - b) automatic pistols
  - c) police weapon
  - d) sporting guns



8. Sporting gun is:
  - a) A long rifle weapon.
  - b) A short rifle weapon.
  - c) A long non-rifle weapon.
  - d) Firing bullets.
  
9. Which of the following increases a bullet's wound profile?
  - a) Tumbling 180 degrees upon impact
  - b) The use of rifling in the barrel of the firearm
  - c) "Mushrooming" on impact
  - d) both a) and c)
  
10. The path a projectile follows during a flight is called its:
  - a) cavity
  - b) drag
  - c) ballistics
  - d) trajectory
  
11. Which calibre is considered the weakest (in terms of energy) of the following:
  - a) .25 Auto
  - b) .22 magnum
  - c) .32 Auto
  - d) .22 LR
  
12. A device for storing cartridges in a repeating firearm for loading into chamber is called as:
  - a) Cylinder
  - b) Magazine
  - c) Breech block
  - d) Firing pin
  
13. Who is considered the father of Modern Handgun Fighting and Modern Technique?
  - a) Col. Jeff Cooper
  - b) Jessie James
  - c) Elmer Keith
  - d) Chuck Taylor
  
14. Wad cutter is a type of :
  - a) Firearm
  - b) Propellant
  - c) Bullet
  - d) Percussion cap
  
15. Handgun that has a cylinder with holes to contain the cartridge is:
  - a) Pistol
  - b) AK-74
  - c) Stand gun
  - d) Revolver

16. The abbreviation 'FMJ' used for bullets stands for:
- Full movement jet
  - Full metal jacket
  - Free movement jacket
  - Free mining jest
17. INSAS stands for:
- Indian Small Arms System
  - Indonesia Small Arms System
  - Infantry Small Arms System
  - Indian Semi-auto System
18. Which of the following is not the integral part of a live shotgun cartridge?
- Shell
  - Wad
  - Projectile
  - Stock
19. Cordite (Double base powder) is a combination of :
- NG, NC and Ammonium Nitrate
  - NG, NC and Potassium Chlorate
  - NG, NC and Mineral Jelly
  - NG, NC and Mercury Fulminate
20. An ideal powder should produce \_\_\_\_\_ smoke
- Minimum
  - Maximum
  - Stable
  - All of the above
21. A firearm which uses trombone action for loading & unloading is known as \_\_\_\_\_
- Bolt Action
  - Lever Action
  - Repeaters
  - Hammer Action
22. What is head space?
- Clearance between cartridge case and chamber
  - Clearance between cartridge case and bolt face
  - Clearance between Chamber and bolt face
  - Clearance between cartridge case and breech face
23. What does the 'M' designation on a gun stands for? (e.g. Mu Carbine, M1 M1 rifle)
- Military
  - Model
  - Meaningless
  - Moritzgewehr

24. Which of the following is associated with assault rifle wounds but not hunting rifle wounds?
- A small, light bullet does the most harm
  - The larger the bullet the smaller its energy
  - A high velocity bullet is three times less likely to do major harm
  - The hunting rifle's bullet is usually a lighter bullet, it travels faster
25. What is the velocity of Pellets which are fired from Air-Gun?
- 10-12 m/sec
  - 55-60 m/sec
  - 90-120 m/sec
  - 200-210 m/sec
26. Rifled firearm cartridge case is generally made up of:
- Aluminum
  - Lead
  - Brass
  - Steel alloys
27. Comparison microscope was discovered by:
- Kevin Goddard
  - Francis Galton
  - Col. Jeefer
  - Gram Bell
28. The Bullets which Blast on hitting the target are known as?
- Rotax Bullet
  - Dumdum Bullet
  - Hollow point Bullet
  - Incendiary Bullet
29. \_\_\_\_\_ Microscope is used to visualize the 3-D view of the Marks:
- Travelling Microscope
  - Stereomicroscope
  - Compound Microscope
  - Fluorescence Microscope
30. Revolver was invented by:
- S. Colt
  - Col. Kenz
  - D. Kolt
  - Co. Goddard
31. Multiple Barrel Pistols are known as:
- Sniper
  - Rifle
  - Derringers
  - Carbine

32. What is the muzzle velocity of INSAS Rifle?
- a) 900m/sec
  - b) 150 m/sec
  - c) 1300 m/sec
  - d) 2200 m/sec
33. AK-47 was discovered in the year:
- a) 1956
  - b) 1974
  - c) 1947
  - d) 1990
34. The phenomena of making the firearm, ready to fire is known as:
- a) Trigger
  - b) Hammer
  - c) Cock
  - d) Safety
35. Spread of pellet is more in which type of choke:
- a) Jug choke
  - b) Cone choke
  - c) Poly choke
  - d) Reverse choke
36. Gun powder was developed by:
- a) RichelFerd
  - b) Roger Bacon
  - c) Bertillon
  - d) None of the above
37. Use of firearm was started in which year:
- a) 14<sup>th</sup> Century
  - b) 16<sup>th</sup> century
  - c) 19<sup>th</sup> century
  - d) 11<sup>th</sup> century
38. What is a mechanical safety?
- a) Half cock
  - b) Integral to the design of the weapon
  - c) Must be applied by the user
  - d) Any safety that physically blocks the cycles of operation
39. Pistols are best categorized as:
- a) Self-loader
  - b) Bolt Action
  - c) Stand guns
  - d) Automatic



40. \_\_\_\_\_ is hurled out of firearm due to pressure of gases produced
- Projectile
  - Propellant
  - Per. Cap
  - Both a) & c)
41. NG is induced in NC to increase its:
- Kinetic Energy
  - Velocity
  - Potential Energy
  - Stability
42. If a bore number of a barrel is 12, then the diameter (in cms) of barrel will be:
- 1.23
  - 2.10
  - 2.97
  - 1.85
43. A man was shooting from a close distance range by shotgun, what will be the characteristic finding?
- Rat hole
  - Oval hole
  - Muzzle imprint
  - None of the above
44. In wound ballistic, pattern of shots signifies:
- Bore of gun
  - Make of gun
  - Range of firing
  - Type of cartridge Fired
45. \_\_\_\_\_ fabric is most widely used for the purpose of bulletproof jacket.
- Silicone Gel
  - Kevlar
  - Viscose-elastic
  - Carbide Plates
46. Source of oxygen in a percussion cap is:
- Potassium Chlorate
  - Mercury Ferminate
  - Lead Azide
  - Carbon
47. Size of entry wound is less than exit wound caused by the same bullet due to:
- More elasticity of skin at inlet
  - Due to recoil
  - Due to shape of bullet
  - More elasticity of skin at exit.

48. In .303 rifle the pitch in one turn is:  
a) 3"  
b) 10"  
c) 5"  
d) 17"
49. Characters of firearm injuries are:  
a) loss of substance  
b) powder marks  
c) inlet & exit  
d) all of the above
50. Which of the following is considered a high velocity weapon?  
a) Rifle  
b) Arrow  
c) Handgun  
d) Shotgun
51. The pathway of injury in the wake of a penetrating mechanism is called the:  
a) Cavity  
b) Cone of injury  
c) Trajectory  
d) Profile
52. The first primitive firearm was:  
a) Roman Candle  
b) Match lock  
c) Muzzle Loader  
d) Wheel lock
53. What is the average length of the barrel required for the complete combustion of modern powder?  
a) 30cm  
b) 5cm  
c) 12 cm  
d) 70 cm
54. Pump action is also known as:  
a) Gas action  
b) Retarded blow back action  
c) Trombone action  
d) Bolt action
55. Which of the following is the Example of a Primer Charge?  
a) Mercury Fulminate  
b) Ammonium Nitrate  
c) Potassium Chlorate  
d) Nitrogaudine



56. \_\_\_\_\_ is the Example of Indentation marks.
- Breach Face marks
  - Drag marks
  - Firing pin mark
  - Slippage marks
57. Under the SEM lead GSR particles show the shape of:
- Spheroidal
  - Cylindrical
  - Tube shape
  - Disc shaped
58. Indication of Blue spots on the cast in dermal nitrate test shows the presence of \_\_\_\_\_ particles in the GSR.
- Lead
  - Nitrate
  - Nitrite
  - Antimony
59. What is the latest standard according to NIJ for the Bullet-proof testing of the Jacket?
- 01.01.06
  - 01.01.03
  - 01.09.13
  - 01.01.10
60. "Match-Point" is the Integral unit of:
- BDAS
  - Comparison Microscope
  - Compound Microscope
  - Integrated Ballistics Identification System
61. Which Spectroscopy is used for the Elemental Analysis?
- AAS
  - NMR
  - FTIR
  - UV-VIS
62. What is the escape velocity from the surface of earth?
- 11.2 m/sec
  - 5.2 km/sec
  - 11.2km/sec
  - 5.2 m/sec
63. 0.303 rifle has which type of Action?
- Bolt Action
  - Lever Action
  - Recoil Action
  - None of the above

64. Barium Peroxide is used in which type of Bullets?  
a) Rotrax Bullet  
b) Tracer Bullet  
c) Jacketed Bullet  
d) Soft nose bullet
65. Engraved part of the Rifling is known as:  
a) Grooves  
b) Land  
c) Both a & b  
d) None of the above
66. What is the Muzzle velocity of 12 bore Double Barrel shotgun?  
a) 763f/s  
b) 130 f/s  
c) 1050f/s  
d) 2100 f/s
67. What weapons are commonly referred to as small arms according to NATO?  
a) Any weapon with barrel length less than 18.5"  
b) Any shoulder or hand controlled weapon  
c) Any Weapon with a caliber less than 20 mm  
d) .50 caliber BMG and under
68. Threshold velocity to penetrate the skin is:  
a) 10-12 m/sec  
b) 40-50 m/sec  
c) 70-75 m/sec  
d) 5-7 m/sec
69. If your firing pin protrudes a little too much, what can happen?  
a) Primer cratering  
b) Primer perforation  
c) Firing pin will break  
d) Cartridge will be driven forward in the chamber
70. Which of the following is the Example of Primer Charge?  
a) Mercury Fulminate  
b) Ammonium Nitrate  
c) Potassium Chlorate  
d) Nitrogaudine
71. When assessing someone with a Gunshot wounds from a rifle, which of the following is important to remember?  
a) The zone of injury is larger than that expected with other types of weapons.  
b) The cavitation is limited to the direct path of the bullet.  
c) The trajectory is longer, allowing more energy to be dissipated by drag before it strikes the victim  
d) The muzzle velocity is less than that of a handgun

72. What is the Muzzle velocity of 12 bore Double Barrel shotgun?  
a) 763 f/s  
b) 130 f/s  
c) 1050 f/s  
d) 2100 f/s
73. Size of entry wound is less than exit wound caused by the same bullet due to:  
a) More elasticity of skin at inlet  
b) Due to recoil  
c) Due to shape of bullet  
d) More elasticity of skin at exit.
74. Individual characteristics can be best studied under:  
a) Magnifying Lens  
b) Stereo microscope  
c) Borescope  
d) Comparison Microscope
75. Muzzle blast is observed due to:  
a) Inflow of air  
b) Out rush of Hot gases  
c) Out rush of bullet  
d) All of the above
76. The main function of percussion cap is:  
a) To separate shots from powder  
b) To produce a spark  
c) To keep shots in place  
d) To act as a piston for the shots
77. Which of the following is not a characteristic for bullet classification?  
a) Ogive shape  
b) Heel  
c) Base shape  
d) Rim
78. Kinetic energy of the projectile can be calculated by:  
a)  $K = \frac{1}{2} MV^2$   
b)  $K = MV$   
c)  $K = \frac{1}{2} M^2 V^2$   
d)  $M = KV$
79. Circumference of the deformed bullet can be calculated by:  
a)  $\pi r^2$   
b)  $2 \pi r$   
c)  $\pi/r$   
d)  $r^2$



80. Boat tailed bullets are best known for:
- Reducing base drag
  - Increasing Velocity
  - Reduction in velocity
  - Infliction on the target
81. "Jump" is the word associated with:
- Firearm
  - Bullet
  - Cartridge case
  - Priming composition
82. LMG stands for:
- Light modern Gun
  - Light Machine Gun
  - Lead Mass Gun
  - Latter Machine Gun
83. Tattooing is caused by:
- hot gases
  - smoke
  - shots
  - unburnt powder particles
84. Major Components of Gun powder is:
- Potassium Chlorate
  - Carbon
  - Potassium Nitrate
  - Charcoal
85. Singeing of hair occurs due to:
- Contact of hair with flame
  - Contact of hair with GSR
  - Contact of hair with hot bullet
  - Contact of hair with muzzle end of barrel
86. Which one of the following is not a handgun cartridge?
- .416 Rem Mag
  - .44 Russian
  - .460 S & W
  - .454 Casull
87. What is generally recommended as the smallest "personal defense calibre" by most of the self defense instructors?
- .380 Auto
  - SLR
  - .22 Rifle
  - Carbine

88. Which of the following is associated with assault rifle wounds but not hunting rifle wounds?
- A small, light bullet does the most harm
  - The larger the bullet the smaller its energy
  - A high velocity bullet is three times less likely to do major harm
  - The hunting rifle's bullet is usually a lighter bullet, it travels faster
89. Rifling is induced in barrels to provide:
- Gyrotory Motion
  - Kinetic motion
  - Mechanical motion
  - None of the above
90. A cartridge that has primer distributed around the periphery of the base is known as:
- Center fire
  - Pin fire
  - Rim fire
  - Percussion fire
91. What is the velocity of Pellets which are fired from Air-Gun?
- 10-12 m/sec
  - 55-60 m/sec
  - 90-120 m/sec
  - 200-210 m/sec
92. Threshold velocity of bone to get perforated by projectile is:
- 10 m/sec
  - 60 m/sec
  - 95 m/sec
  - 85 m/sec
93. Bullets and cartridge Case from the crime scene are collected with the help of:
- Rubber forceps
  - Cellophane tape
  - Scissor
  - Tweezer
94. Most common rifle 7.62 mm 1A1 has:
- 6 grooves with LH twist
  - 6 grooves with RH twist
  - 4 grooves with LH twist
  - 4 grooves with RH twist
95. Harrison Gilroys test is used to detect the \_\_\_\_\_ particles in the GSR.
- Tungsten
  - Nitrate
  - Metal oxide
  - Barium

96. The Terminology which is given to describe the Tip shape of the Bullet is:
- a) Ogive shape
  - b) Base shape
  - c) Jacketting
  - d) Heel shape
97. In .303 rifle the pitch in one turn is:
- a) 3"
  - b) 10"
  - c) 5"
  - d) 17"
98. What prevents the hot gases from the burning propellant from escaping from the rear of the chamber instead of pushing the projectile down the barrel?
- a) Rifling lands
  - b) Chamber obstruction
  - c) Rifling grooves
  - d) Flash suppressor
99. If you find extractor and ejector marks on the cartridge case, what would be the possible firearm used?
- a) Pistol
  - b) Revolver
  - c) 12 bore Shotgun
  - d) None of the above
100. Which statement about ballistics is true?
- a) Damage is less when the bullet does not exit the body.
  - b) In penetrating trauma, the mass of a projectile is more significant than its velocity when determining kinetic energy
  - c) When a bullet yaws, it increases the damage
  - d) When a bullet tumbles, it decreases the damage

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