Claims

[Claim 1] A method performed by a user equipment (UE) in a wireless communication system, the method comprising:
receiving, from a base station (BS), code block group (CBG) information via radio resource control (RRC) signaling;
identifying a first physical downlink shared channel (PDSCH) set or a second PDSCH set to which each of a plurality of PDSCHs belong, based on the CBG information;
determining a first hybrid automatic repeat request acknowledgement/ negative acknowledgement (HARQ-ACK/NACK) codebook for the first PDSCH set and a second HARQ-ACK/NACK codebook for the second PDSCH set; and
transmitting HARQ-ACK/NACK information generated by connecting the first HARQ-ACK/NACK codebook and the second HARQ-ACK/NACK codebook.

[Claim 2] The method of claim 1, further comprising:
determining an offset for the HARQ-ACK/NACK information based on a configured set for the offset corresponding to a number of bits included in the HARQ-ACK/NACK information.

[Claim 3] The method of claim 1, wherein the HARQ-ACK/NACK information is generated by appending the second HARQ-ACK/NACK codebook to the first HARQ-ACK/NACK codebook.

[Claim 4] The method of claim 1, wherein identifying the first PDSCH set or the second PDSCH set comprises:
identifying that a PDSCH of the plurality of PDSCHs belongs to the first PDSCH set, in a case that the PDSCH is scheduled on a carrier configured with transport block-based (TB-based) HARQ-ACK/NACK feedback or scheduled, by fallback downlink control information (DCI), on a carrier configured with CBG-based HARQ-ACK/NACK feedback; and
identifying that the PDSCH of the plurality of PDSCHs belongs to the second PDSCH set, in a case that the PDSCH is scheduled, by a non-fallback DCI, on the carrier configured with CBG-based HARQ-ACK/NACK feedback.

[Claim 5] The method of claim 1, wherein determining the second HARQ-ACK/NACK codebook comprises:
determining a number of HARQ-ACK/NACK information bits for the second HARQ-ACK/NACK codebook based on a maximum value of values associated with CBGs of carriers configured with CBG-based HARQ-ACK/NACK feedback.

[Claim 6] The method of claim 1, wherein, determining the first HARQ-ACK/NACK codebook comprises:
determining a number of HARQ-ACK/NACK information bits based on HARQ-ACK/NACK spatial bundling and a number of transport blocks (TBs) being received on at least one BWP of a carrier.

[Claim 7] The method of claim 6, wherein, determining the first HARQ-ACK/NACK codebook comprises: in a case that HARQ-ACK/NACK spatial bundling is not applied and reception of two TBs is configured

for the at least one BWP of the carrier, generating two HARQ-ACK/NACK information bits for a PDSCH on the carrier, and
in a case that a HARQ-ACK/NACK spatial bundling is applied and the reception of two TBs is configured for the at least one BWP of the carrier, generating one HARQ-ACK/NACK information bit for the PDSCH on the carrier.

[Claim 8] A user equipment (UE), comprising:
a transceiver; and
a processor coupled with the transceiver and configured to:
control the transceiver to receive, from a base station (BS), code block group (CBG) information via radio resource control (RRC) signaling,
identify a first physical downlink shared channel (PDSCH) set or a second PDSCH set to which each of a plurality of PDSCHs belong, based on the CBG information;
determine a first hybrid automatic repeat request acknowledgement/ negative acknowledgement (HARQ-ACK/NACK) codebook for the first PDSCH set and a second HARQ-ACK/NACK codebook for the second PDSCH set, and
control the transceiver to transmit HARQ-ACK/NACK information generated by connecting the first HARQ-ACK/NACK codebook and the second HARQ-ACK/NACK codebook.

[Claim 9] The UE of claim 8, wherein the processor is further configured to:
determine an offset for the HARQ-ACK/NACK information based on a configured set for the offset corresponding to a number of bits included in the HARQ-ACK/NACK information.

[Claim 10] The UE of claim 8, wherein the HARQ-ACK/NACK information is generated by appending the second HARQ-ACK/NACK codebook to the first HARQ-ACK/NACK codebook.

[Claim 11] The UE of claim 8, wherein the processor is further configured to:
identify that a PDSCH of the plurality of PDSCHs belongs to the first PDSCH set, in case that the PDSCH is scheduled on a carrier configured with transport block-based (TB-based) HARQ-ACK/NACK feedback or scheduled, by a fallback downlink control information (DCI), on a carrier configured with CBG-based HARQ-ACK/NACK feedback, and
identify that a PDSCH of the plurality of PDSCHs belongs to the second PDSCH set, in case that the PDSCH is scheduled, by a non-fallback DCI, on the carrier configured with CBG-based HARQ-ACK/NACK feedback.

[Claim 12] The UE of claim 8, wherein the processor is further configured to:
determine a number of HARQ-ACK/NACK information bits for the second HARQ-ACK/NACK codebook based on a maximum value of values associated with CBGs of carriers configured with CBG-based HARQ-ACK/NACK feedback.

[Claim 13] The UE of claim 8, wherein the processor is further configured to:
determine a number of HARQ-ACK/NACK information bits based on HARQ-ACK/NACK spatial bundling and a number of transport blocks (TBs) being received on at least one BWP of a carrier.

[Claim 14] The UE of claim 13, wherein the processor is further configured to:
in a case that HARQ-ACK/NACK spatial bundling is not applied and

reception of two TBs is configured for the at least one BWP of the carrier, generate two HARQ-ACK/NACK information bits for a PDSCH on the carrier, and
in a case that HARQ-ACK/NACK spatial bundling is applied and the reception of two TBs is configured for the at least one BWP of the carrier, generate one HARQ-ACK/NACK information bit for the PDSCH on the carrier.

[Claim 15] A method performed by a base station (BS) in a wireless communication system, the method comprising:
transmitting code block group (CBG) information via radio resource control (RRC) signaling;
transmitting, to a user equipment (UE), a plurality of physical downlink shared control channels (PDSCHs); and
receiving hybrid automatic repeat request acknowledgement/negative acknowledgement (HARQ-ACK/NACK) information for the plurality of PDSCHs,
wherein a first PDSCH set or a second PDSCH set to which each of the plurality of PDSCHs belong, is identified based on the CBG information,
wherein a first HARQ-ACK/NACK codebook is determined for the first PDSCH set,
wherein a second HARQ-ACK/NACK codebook is determined for the second PDSCH set, and
wherein the HARQ-ACK/NACK information is generated by connecting the first HARQ-ACK/NACK codebook and the second HARQ-ACK/NACK codebook.

[Claim 16] A base station (BS) comprising:
a transceiver; and
a processor coupled with the transceiver and configured to control the transceiver to:
transmit code block group (CBG) information via radio resource control (RRC) signaling;
transmit, to a user equipment (UE), a plurality of physical downlink shared control channels (PDSCHs); and
receive hybrid automatic repeat request acknowledgement/negative acknowledgement (HARQ-ACK/NACK) information for the plurality of PDSCHs,
wherein a first PDSCH set or a second PDSCH set to which each of the plurality of PDSCHs belong, is identified based on the CBG information,
wherein a first HARQ-ACK/NACK codebook is determined for the first PDSCH set,
wherein a second HARQ-ACK/NACK codebook is determined for the second PDSCH set, and
wherein the HARQ-ACK/NACK information is generated by connecting the first HARQ-ACK/NACK codebook and the second HARQ-ACK/NACK codebook.